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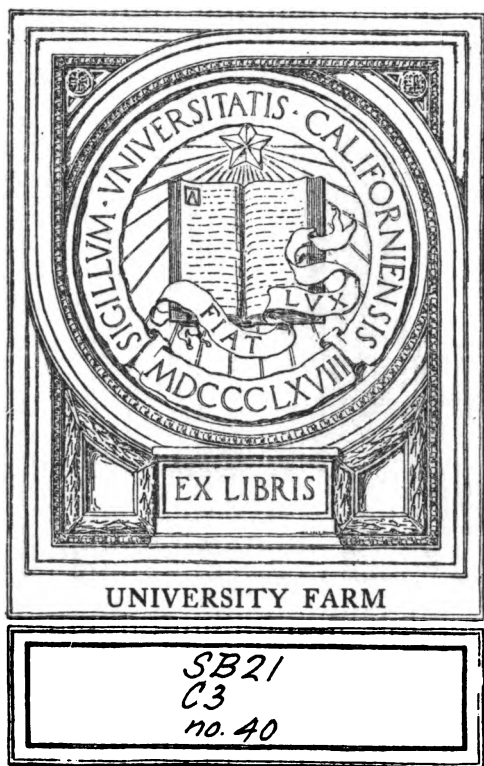
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*Proceedings / California. Fruit
Growers and Farmers Convention*



PROCEEDINGS
OF THE
FORTIETH
FRUIT GROWERS' CONVENTION
OF THE
STATE OF CALIFORNIA
HELD UNDER THE AUSPICES OF THE
STATE COMMISSION OF HORTICULTURE

AT

Santa Rosa, California, December 19, 20, and 21, 1911



SACRAMENTO
FRIEND WM. RICHARDSON - - SUPERINTENDENT OF STATE PRINTING
1912

OFFICERS OF THE CALIFORNIA STATE COMMISSION OF HORTICULTURE.

EXECUTIVE OFFICE.

Capitol Building, Sacramento.

A. J. COOK.....Commissioner.
G. E. MERRILL.....Chief Deputy Commissioner.
E. O. ESSIG.....Secretary.
H. S. FAWCETT.....Plant Pathologist.
MISS A. G. BIRD.....Clerk.

INSECTARY DIVISION.

Capitol Park, Sacramento.

E. K. CARNES.....Superintendent.
H. A. WEINLAND.....Assistant Superintendent, Honolulu, Hawaii.
E. J. BRANIGAN.....Field Deputy.
E. J. NEWCOMER.....Assistant.

QUARANTINE DIVISION.

San Francisco Office: Room 11, Ferry Building.

O. E. BREMNER.....Chief Deputy Quarantine Officer.
GEO. COMPERE.....Quarantine Inspector.
B. B. WHITNEY.....Quarantine Inspector.

LOS ANGELES OFFICE.

703 Equitable Savings Bank Building.

A. S. HOYT.....Deputy Quarantine Officer.
C. H. VARY.....Quarantine Inspector.

SAN DIEGO OFFICE.

Court House.

E. O. AMUNDSEN.....Quarantine Inspector.

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PROCEEDINGS

OF THE

FORTIETH STATE FRUIT GROWERS' CONVENTION OF CALIFORNIA

Held Under the Auspices of the State Commission of Horticulture, Santa Rosa,
December 19, 20, and 21, 1911.

MORNING SESSION—FIRST DAY.

Pursuant to call, the convention met at Germania Hall, Santa Rosa, California, at ten o'clock A. M.

The convention was called to order by Chairman A. J. Cook, State Commissioner of Horticulture.

Mr. E. O. Essig, secretary of the State Commissioner of Horticulture, acted as secretary.

After an invocation by the Reverend W. C. Day of Santa Rosa, followed by music, the proceedings continued as follows:

THE CHAIRMAN. We will now be welcomed by his Honor, J. R. Edwards, mayor of this city. [Applause.]

MR. EDWARDS. *Mr. Chairman, Ladies and Gentlemen:* Situated as we are in the center of a country that is given over very largely to the growing of the tree and the vine, it is very fitting that I extend to you a cordial greeting, and as the representative of the citizens of Santa Rosa I extend to you a very hearty welcome.

It has been a great many years since the pioneers came across the plains into California. At that time they were in quest of gold. They little thought that the valleys and the hills and the plains of California were going to be devoted to the raising of fruit; but since that time things have progressed so that the output from the orchards and the vineyards and the fields of California for the past year was twice that of the best year that was ever seen in California in the production of gold. This simply shows that the man who has a fine orchard, or a fine piece of land devoted to the culture of the tree, or the vine, has an everlasting gold mine. He simply has to take care of it properly and it means that money is coming his way.

We have seen that around this locality this year and for a few preceding years the large checks that the farmers have received for their products have been very gratifying. And when you take all into consideration you may say that the centers of population are builded up off of the farm, and why should we not receive a good price for our products?

Your sessions here will be devoted to all that is good, bringing different ideas from different parts of the State, and I am sure that you will all gain a great deal from this convention; and I hope you will,

and when you depart from Santa Rosa, I hope you will take pleasant memories to your firesides, and that you will think kindly of us when you get home. [Applause.]

THE CHAIRMAN. *Mr. Mayor, Ladies and Gentlemen:* This kind and generous welcome from the mayor of this beautiful city is no surprise to us. Your enterprise and hospitality have been noised abroad and have greeted our ears throughout the confines of the entire State. We have heard of your oranges—always in Cloverdale—and your Gravenstein apples and the superb exhibitions of your suburban city of Sebastopol have been noised far across the mountains and sea. You know what the Archbishop of Canterbury said of the strawberry, "Doubtless God might have made a better berry, but doubtless He never did"; so if all the stories are true, doubtless God might have made a more favorable county than Sonoma, for the apple and the grape and the plum and a finer folk to prune and care for them, but doubtless He never did. May I tell you a little secret that was whispered to my ears the other day? That the display of fruit at the recent Watsonville exhibition was superb and that the banner fruit and pack was from Sonoma County. It was not a Sonoma County man that confided this opinion to me. We thank you, Mr. Mayor, and ladies and gentlemen, for this hearty welcome, for these beautiful decorations, for the fine display of fruit to be seen at the room of the Chamber of Commerce, for the splendid work done to further the success of this meeting. It all argues eloquently for the success and value of this conference together.

As I am such a late comer to this northland, though an old-time resident and farmer as well, for I own a splendid ranch in a near-by county, it was thought best by the chairman of the program committee that I should not take a prominent place on the program. Thus I take advantage of this occasion to give you a brief sketch of my desire and aims in my new office and as your servant.

It is my earnest desire to coöperate with our fruit growers and ranchers in every way possible. Please bear this in mind and never forget that the ear of your commissioner is ever to the ground to catch the faintest lisp of need that may come from any of you. We are also eager to gain any hint of improvement in cultural methods or other improvement from any of you that we may send it broadcast to all our growers.

Of course, the main work of this commission, for which it was established, is to aid in the control of insect and fungous pests. We, myself and colleagues, will ever stand ready to advise regarding insect ravages and fungoid attacks and to identify all insects that essay to rob you of your fruit and vegetables and to advise you as to the latest and best means to combat these ubiquitous foes.

It is my pleasure to state that we are so fortunate as to secure the services of one of the best mycologists in the world, who will be with us after February 1st. Prof. H. S. Fawcett, of Florida, is one of the very first students of fungi, and those infinitesimal bacteria which are so difficult of detection. Professor Fawcett has just made two very important discoveries; first, that stem end rot of citrus fruits, a new disease, is not only the result of the attack of micro-organisms, but he has discovered the germ, has used it successfully to inoculate healthy fruit, and what is more to the point, has proved a way to its control.

His second discovery concerns not a new pest, but an old one, the well-known gummosis. This is also bacterial, not physiological, as has been supposed. The specific organism is identified, and control methods are explained. It is interesting to learn that gummosis of the peach and the citrus fruits is one and the same malady, caused by the same specific germ. Like the bacterium that produces stem end rot, it produces spores, so that the ailment may come from the mycelium or from the spores. The control comes from the same method that conquers the pear blight, severe pruning and cutting away. One of the most successful pear growers of Sacramento County, Mr. E. A. Gammon, has done royal service in his fight with pear blight, which surely is "to the knife." His work is as phenomenal as is his success. Greatly are we to be congratulated that we are to have Professor Fawcett. He is our man, and he will prove a great asset to our State and people.

You will be much interested in two valuable papers by two of my colleagues, the one, on quarantine, by Mr. Bremner and the other, on the terrible Mediterranean fly (*Ceratitis capitata*), by Mr. Carnes. This latter, fairly knocking at our doors, like the Mexican orange maggot, *Anastrepha (Trypeta) ludens*, to which it is closely related, would be a frightful pest, if once introduced. It must be kept out. Various destructive scale insects, the potato eelworm (*Heterodera radiculicola*) and the alfalfa weevil (*Phytonomus murinus*), all alarming foes and all just at the very entrance way of our State, show how important it is that we maintain the strictest quarantine, which we will do at every cost. We must be able to guard entrance points where railroads come into our State, and must be legally authorized to search baggage and even persons if safety to our fruit growers demands it. This year our orchards emptied more than \$75,000,000 into our state pocket-book. Can we dare to neglect a single effort that shall conserve this splendid source of gain?

Once more this commission wishes to coöperate most fully with the several county commissioners. We must be mutually helpful to each other. We can and will gladly identify all insects that come to rob our people of their hard-earned gains. We shall advise with you and suggest how to cope with any pest or disease, either insect, fungoid or physiological. We hope for as valuable aid from you. You are at the source of disturbance, and we shall count on you for information and suggestion regarding all attacks from fungi or insects. I hope you all will, with us, be hard students in this field of work and study. We must all be "live wires" and grow apace. I will always take pleasure in promoting such growth.

Our nurseries are also of great interest to us. Most, I believe, are clean and a credit to their owners and to the State. Some are surely foul with insect despoliation or fungoid disturbance. We all know that a dirty nursery is the seat or center of contamination, as in the case of the San Jose scale, which may contaminate the whole country far and wide. We must have only clean nurseries. I am sure that nearly all our proprietors of nurseries the State over will coöperate to the fullest degree to accomplish this important end. The county commissioners can do much to secure this cleaning up of infested nurseries. The quarantine law can be very potent to this end and must be in case the better way is ineffective. I hope we will never need to quarantine against any of our nurseries. Let us all work to make such action unnecessary.

You will all have received our monthly bulletin, which will come to all who desire it each month. We shall spare no effort to make it practical, and shall aim to give through its columns the latest and best in practical entomology and mycology. May we not expect you all to aid us by rich and generous contributions to its columns, sending us liberally of your observations and discoveries, that it may become the prized medium of exchange and communion between our office and the ranches of the State? Our field deputy will be quick to respond to any and every call, and will be a most helpful agent in the bond of unity that must and will unite us in one great industrial brotherhood.

Now, my friends, if I may take the liberty, we will diverge a little from the regular order, and will take up this matter of petition to the Governor, if you so desire.

Before anybody offers a resolution, and I imagine somebody has got it on their mind to do it, I should like Mr. Bremner to come forward and speak briefly in regard to this action. You know Mr. Bremner, and you know he will speak from his heart. [Applause.]

MR. O. E. BREMNER. *Ladies and Gentlemen:* The Professor did not tell me that I was to speak before the meeting, so this is thoroughly extemporaneous.

When we brought this matter before the Governor we put it in the light that we were up against a proposition that had not arisen before our time, and one that needed immediate action.

We did not know of the existence of the Mediterranean fruit fly until last October a year ago, and the quarantine was not established until last June. Up to that time, as many of you commissioners and the fruit growers know, the law had been carried out to the letter. In that it was provided that owners or shippers had the option of returning such shipments to the point of shipment or destroying them. The quarantine officer or state quarantine guardians have no authority to destroy that fruit or plant whatever it may be without the permission of the man who ships it in. It works all right in the matter of nursery stock, but when it came to an insect like the Mediterranean fruit fly it did not work at all. On the 26th of June we were moved to the San Francisco office and we started to work. The first act was the quarantine of twenty cases of tea in bond to Los Angeles. There are special ways in which you have to bring that tea in, in special wrappers, and it has to be carried through a special red-tape manner of getting initials. We had to apply to the collector of the port to gain permission to quarantine this tea. The reason for that was this, that on board the ship in which the tea came was a package of fruit, and in this package were several different kinds, which were absolutely full of the Mediterranean fruit fly. This was taken off the ship, and put on the dock alongside of a post, where it was allowed to remain for twenty-four hours while they endeavored to find the owner. Meanwhile, the insects had crawled out of the fruit into the cracks of the post and also on the dock, as well as in some chests of tea, and among the wrappers of the chests of tea. As a result we had to take off the wrappers of some of the chests of tea which were in the immediate vicinity, destroy them, and also disinfect the post and dock. This was the first act.

We immediately saw that we could not allow that fruit and stuff to lie around for twenty-four hours awaiting the decision of the owner, so

we took the law in our own hands and when the fruit arrived destroyed it and took chances of being arrested. We have not been arrested, but we have been threatened with arrest. We have destroyed fruit on board ship, and the Attorney General tells us we have no right to do that. As I told the Governor last Saturday, we were simply bluffing, and I see no reason why the State of California ought to have an officer bluffing in the absence of any other method of action.

The matter was not brought to the attention of the Governor as it should have been for the reason that we had no decision from the Attorney General. We asked for a decision last October of this year, so that it could be included in the special call, but the answer to our inquiry to the Attorney General was not handed down till the 8th of December, which made it too late to be included in the call.

As a result, the matter was taken to the Governor as soon as we could, and was presented to the committees of the two houses, and he has practically agreed to call the extra session.

The bill is in the hands of Senator Cutten, who is working it out. The draft of the bill was placed in his hands, so that it probably will come up next Saturday.

The Governor and your Mr. Slater here requested particularly that the fruit growers should pass a resolution, or something, voicing their sentiments on this matter which would back him up in his making this special call for this purpose.

I believe the Governor's heart is with us. I know that he is a man that investigates thoroughly everything before he acts, and when he acts he sets his jaw and acts right, and I know he is going to do what is right in this case, and it is merely up to us to state what we want; and I am sure we have Governor Johnson and the legislature behind us.

THE CHAIRMAN. Ladies and gentlemen, shall we talk any further on this, or shall we at once have a resolution, if anybody has one prepared?

JUDGE LATIMER. I do not want to make any talk about it; just merely to make a motion in regard to it. I did not see anybody come up with a resolution drawn up ready, so I merely want to make a motion that our secretary be instructed to draw up a resolution for adoption at this present time.

MR. R. D. STEPHENS. I believe here is a resolution covering the question. If the gentleman will read it?

MR. LATIMER. Do you wish me to read this resolution.

MR. STEPHENS. If you please.

MR. LATIMER—

WHEREAS, The fruit growers of the State of California in convention assembled are of the unanimous opinion that the present and future welfare of our fruit industry rests with the efficiency of the Quarantine Department of the State Commission of Horticulture; and

WHEREAS, We are advised that the present laws are inadequate to carry out the most perfect system of protection to our industry; therefore, be it

Resolved, That we, the fruit growers of this State, earnestly solicit and urge his excellency, Governor Hiram W. Johnson, to call an extra session of the legislature of this State for the purpose of passing a law that will meet all the requirements of the present situation.

THE CHAIRMAN. Does that meet your views?

MR. LATIMER. I move the adoption of that resolution.

MR. ———. I second the motion.

MR. STEPHENS. It is unnecessary to make any further remarks on

the question. The magnitude of its importance is far-reaching and away beyond the conception, I believe, of the minds of any gentleman in this convention. We have hundreds of millions of dollars invested in horticulture here, and having had something to do with this very question some years ago when I was connected with the old commission, I will state that I remember a shipment of fruit coming from an infected district. Alexander Craw was quarantine officer and came to Sacramento to see me—I happened to be chairman of the committee—and he said that it seemed there was no law under which they could handle that shipment, and it was infested. I told him to cremate it. He said, "There is no law covering it." I asked him the value of the assignment, and he said five or six hundred dollars. I said, "I will take the responsibility; you burn it."

I think it is impossible for us to understand the magnitude of this question. I have seen the ravages of that insect. I happened to be in the quarantine office which Mr. Bremner occupies—and I will say with efficiency—and you see it there in everything, in string beans, in tomatoes—you see it in every imaginable thing almost that grows above the soil; and if that should get a foothold here—we run a very narrow escape now according to Mr. Bremner's statement. Mr. Bremner, have you any idea what the appropriation should be?

MR. BREMNER. It should be adequate.

MR. STEPHENS. There should be no limit to that. If it were a hundred thousand dollars it could not be better spent or used than in the way suggested. I hope the resolution will pass without any discussion.

THE CHAIRMAN. Does anybody wish to discuss this before we take a vote? We want to know whether this is unanimous, so I will ask every one in favor of the measure to rise. Mr. Secretary, you can report this as unanimous. So far as I know this is all that need be done.

Judge Latimer, would you suggest that we wire this or send it by letter?

JUDGE LATIMER. By wire.

THE CHAIRMAN. Then the secretary is instructed to wire the Governor at once, or the member of the legislature from here, for he has the matter in charge.

If there is nothing further we will go on with our program. We next have the subject of the "Aphids," by Mr. Essig, who is secretary of our commission.

A word about Mr. Essig: Mr. Essig is a tremendous worker, and when I find such a man I am so interested and I have so much of admiration for him that I can not help speaking of it. So, if I am doing what I ought not to do, you will have to forgive me. I wish to give you two little instances. I was up in Mr. Essig's region when he was county commissioner. I knew he was at it all the night before fumigating, and at ten o'clock in the morning I went out to examine an orchard that had been very much affected with the mealy-bug, and went out to find out what amount of work he had done. Lo and behold! Mr. Essig was there. I said, "My dear boy, you ought to be abed; you were up all night." He said, "We are just starting with our fumigating, and I want to be sure that it is all right." That is where success comes from; I imagine that is what gave the elder Vanderbilt his start in life. About ten o'clock I went to another place, and my friend was there working. I said, "Why, my friend, you ought to be abed," but he said, "I

have got to have this started right. There is where success comes from." I went up to visit him and I took a young man with me. We went up with an automobile and you know what that means; we calculated to get there about seven or eight o'clock and we did not get there before eleven or twelve. My young friend said, "We have got to see Mr. Essig to-night"; and I said, "We will find him in his study." Mr. Essig would be out in the field working all day, and then he would be studying away until eleven or twelve o'clock at night. I did not know but what I had put that thing pretty strong, but when we got there, at eleven or twelve o'clock, which is the time that most of us seek the pillow, Mr. Essig was hard at work. If there is any one I feel like lifting up my hat to it is a man that wants to get his very best in work and labor; and so I take great pleasure and pride in introducing Mr. Essig, who has made a greater study of the aphid in some phases of its work than any other man in the State.

PLANT LICE.

General Structure.

MR. ESSIG. *Ladies and Gentlemen:* I think I can preface my remarks by saying that accidents do happen.

Plant lice are soft-bodied insects belonging to the family *Aphididae*, sub-order *Homoptera* and the order *Hemiptera*. They are true bugs not very distantly related to the Coccids or scale insects.

Though these lice have been observed and known for many years, the true life histories of many are still obscure and unknown. This is due to the large number of different forms of the same species, many of which have been described as distinct and separate species, so the study of the whole family has become a most complicated one.

Nearly every plant has its particular louse, so there are thousands of species for every locality, and it was early thought that no louse fed on more than one host plant. A recent study, however, has developed the fact that there is a rotation of host plants for almost every insect. This rotation is adapted to fit the conditions of temperature and season more than any other conditions. Thus, in spring, the lice will be found on the first green shrub; will then migrate to summer crops, and may become root forms during part of the season.

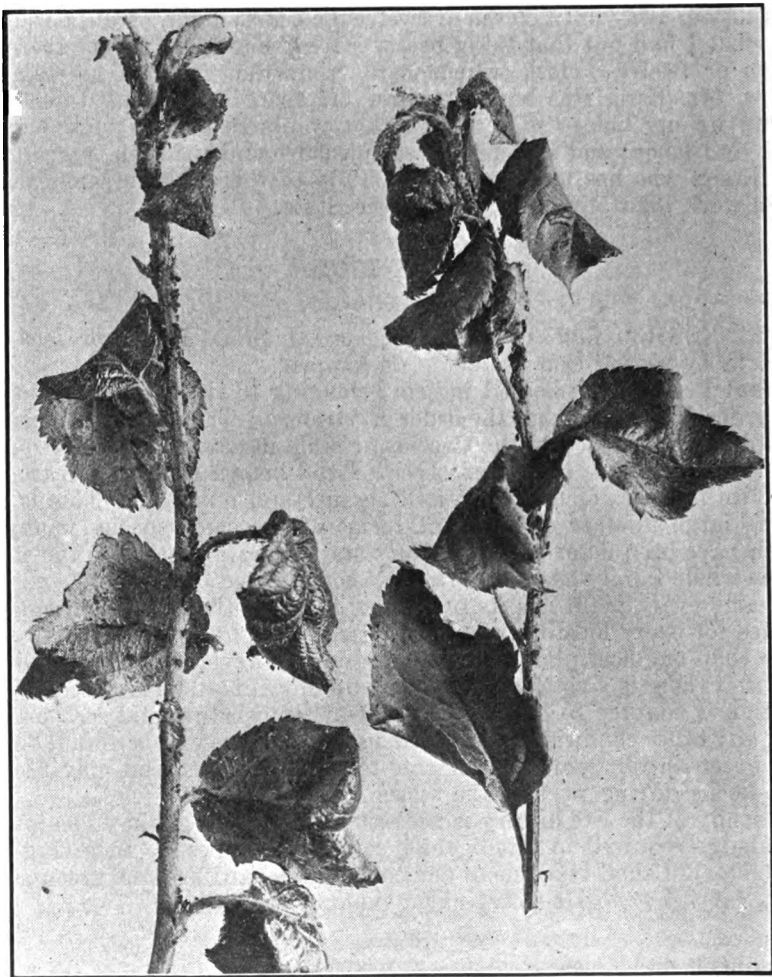
A study of the life history is necessary in order to get any idea of the knowledge required to intelligently combat these pests. In giving this life history, I shall take one of our common orchard lice, the green apple aphid (*Aphis pomi* De Geer) as an example.

Eggs.

We shall first begin with the small black shiny eggs which are found in great numbers on the smooth bark of the rapidly growing twigs or water sprouts of the apple tree. When these eggs were first deposited, some time during the months of October, November, or as late as December, they were of a beautiful green color, but with age turned to a shiny metallic black. A careful examination at the present time of young twigs and water sprouts of an orchard which was infested with this insect last summer will often show great numbers of these eggs—in some cases completely covering the twigs.

The eggs themselves are very tiny, not nearly as large as a pin-head,

and are long and oval in shape. Only a small percentage of them hatch, and this accounts for the large number necessary to produce so many lice for the coming spring. In the eastern states, where the winters are very severe, it is estimated that only one per cent hatch. In California, however, a much larger percentage is able to withstand our milder climate, and so the succeeding infestations are even more severe here than they



The green apple aphid (*Aphis pomi* De Geer). Showing infested shoots of an apple tree. (U. S. Dept. Agrcl.)

are in colder climates. Though such a small percentage hatch you may marvel at the rapidity in which this insect multiplies, but this will be brought out in a further study of the life history.

Just before the apple buds show any green the eggs begin to hatch. This, of course, depends entirely upon the weather, and an early spring will bring a much more rapid development than will a cold, late spring.

Stem Mothers.

The young which hatch from the eggs in the early spring give rise to all succeeding generations, and because of this fact they are known as "stem mothers" when fully developed. The first young are darker green than any of the succeeding broods. In seeking food they work into the newly opening buds and on the first tender leaves. Due to their small size they can scarcely be noticed except by very careful observation. They seek the young buds for two reasons. First, because the tender leaves furnish the first food; secondly, because hid down in the folds of the buds they are free from the attacks of natural enemies, and incidentally out of reach of sprays. In warm weather the young will develop in two or three weeks and become the adult stem mothers. These stem mothers still appear dark green and have a distinct, dark head, feet, tail and honey tubes. They do not have any wings, a characteristic of this brood.

Second Generation.

Every stem mother when full grown has the power (which we call parthenogenesis) to give birth to living young without intercourse with a male, for no males appear at all until late in the fall. The young thus born alive constitute the second generation. They are light green in color, are all parthenogenetic females, and though most of them are wingless, a very few winged individuals appear, but these like the apterous forms are females.

Third Generation.

The new brood of the second generation develop in a few weeks and in turn give birth to living young like themselves, but this third generation is accompanied by a large number of winged females. The apterous and winged females of the succeeding generations are those most usually observed in the orchards and cause the greatest amount of damage. A brief description of each is as follows:

Wingless female. This form is somewhat larger than the original stem mother, and is lighter green in color, with a yellowish tinge. The cornicles (honey tubes), tail, part of the antennæ and the extreme tips of the feet are dark. This form has the power to give birth to both living wingless and winged lice.

Winged female. These are recognized at once by their wings, which are usually folded vertically upon the back. The general color is black and green (the head, thorax, cornicles and portions of the legs and antennæ being black and the remainder green). Like the apterous forms, they have power to produce both winged and wingless forms.

The appearance of the winged individual is very significant in that this migratory form is the principal means of distribution and the formation of new summer colonies. Many plant lice winter over on fruit trees, as does the hop plant louse, and the winged forms later migrate to the hop fields and produce the broods which so trouble the hop growers. Late in the fall the winged forms migrate back from the hop fields to the plum and produce the egg-laying females which deposit their eggs on the trees. The eggs give rise to the next year's broods.

Throughout the entire summer months broods upon broods, each in turn producing other broods, give rise to millions of this destructive pest, and this accounts for their great and destructive numbers. It has been estimated that a single stem mother will give rise to one billion

insects during a single season. During the coming of cold weather, and after the first frost, there is a rapid diminution in numbers, and soon practically all of the winged individuals disappear. This is brought about, especially in the case of the apple aphid, by the development of true sexual forms, male and female.

Sexual Forms.

The parthenogenetic females of the late fall, instead of producing individuals of their own kind, give birth to true sexual forms, male and female, both of which are apterous.

Sexual female. The egg-laying female is much smaller than the summer form, and varies from a rich green to a brownish or reddish color. The head, cornicles, feet and tips of antennæ are dark.

Sexual male. The males are very small, hardly half as large as the other lice. They are easily recognized by their frail and slender bodies, long legs and light yellowish color. The head and tail are noticeably dark. They are much more active than are the sexual females, with which they associate and may be confused. These sex forms copulate and the female produces the eggs which gives rise to the first stem mother already referred to. While the life history of this insect is typical in the number of generations, there are no root forms, as in the cases of the woolly aphid and black peach aphid; neither do winged sexual forms appear as in the case of some other species.

Hosts.

The host plants of the apple aphid are not many. It is found on the apple, pear, hawthorn, quince and flowering crab. Of the apples, those which appear to be the favorites are the Missouri Pippin, Rome Beauty, Black Twig, Ben Davis, Greening, though it works just as effectively on many other varieties. The Northern Spy is fairly free from its attack.

The woolly aphid (*Schizoneura lanigera*) is known to work only on the apple. The green peach aphid (*Myzus persicæ* Sulz.) works on all varieties of deciduous fruit trees and nearly all cultivated plants. Gillette of the Colorado Experiment Station records it on sixty-two plants. The clover aphid (*Aphis bakeri* Cowen) which was first described as a clover pest, the European grain aphid (*Siphocoryne avenæ* Fab.), the rosy apple aphid (*Aphis pyri* Boyer) the sweet clover aphid (*Aphis medicaginis* Koch), and *Aphis sorbi* are other lice likely to be found upon the apple.

Besides the apple lice, we have the following aphids infesting the peach:

Green peach aphid (*Myzus persicæ* Sulz.), the black peach aphid (*Aphis persicæ* Niger-Smith).

The mealy plum louse (*Hyalopterus arundinis* Fab.) the hop plant louse (*Phorodon humuli* Schrank), the rusty plum louse (*Aphis setariae* Thos.) and the green peach aphid are known to infest the plum.

The black cherry louse (*Myzus cerasi*) is the most important aphid affecting the cherry.

The walnut louse (*Chromaphis juglandicola* (Kalt) Walker) is known to all southern California walnut growers.

Lice affecting truck and field crops are:

The melon louse (*Aphis gossypii* Glover) does great damage to

melons, gourds and pumpkin vines all over the world. This insect also attacks cotton, citrus and many plants of no economic importance.

The cabbage louse (*Aphis brassicæ* L.), besides its attacks on cabbage, works on mustard, turnips and all cruciferae.

The beet louse (*Pemphigus betæ* Doane), as well as *Trifidaphis radicola* (Essig), Del Guercio, is found especially in the sugar beet sections. The latter, also works on potato tubers.

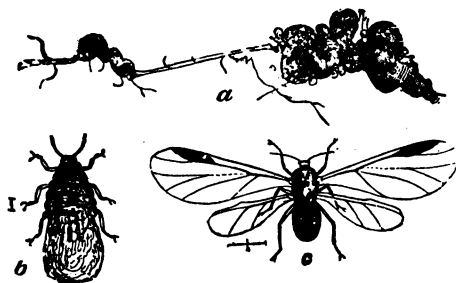
The bean louse (*Aphis rumicis* Linn.) is a common bean pest.

The corn aphid (*Aphis maidis* Fitch) works on the tassels, leaves and ears of corns and sorghums.

The destructive pea louse (*Macrosiphum destructor* Johns.) is a large green aphid working on peas and vetches.

Methods of Control.

Plant lice are more subject to the attacks of other insects than perhaps any other one group of insects, but several species are by no means held in subjection by these natural enemies. In considering methods of control, then, we should take into consideration the natural as well as the artificial.



Woolly aphid (*Schizoneura lanigera* Hausm.);
a, root injury by underground form; b, wingless female; c, winged female. (U. S. Dept. Agrcl.)

Natural Enemies.

Three families of insects are recognized as effectual predaceous enemies of plant lice. They are *Syrphidæ*, *Coccinellidæ*, and *Chrysopidæ*.

Syrphidæ. The larvæ of the Syrphid flies are legless, worm-like animals, which are usually found among the plant lice upon which they feed. These larvæ vary from brown, yellow, or orange to dark green in color, according to the species. They are true maggots, with one end pointed, through which they feed. In feeding, they clasp their support by the blunt end, lift the plant louse bodily into the air with the pointed end and suck out the juices. The most common adult insects have yellow bodies with dark transverse stripes across the abdomen. The small Syrphid (*Allograpta obliqua* Say), the very large Syrphid (*Lasiophthicus pyrastris* L.) and *Syrphus americanus* (Weid.) are common in California.

Coccinellidæ. The work of the ladybird beetles on plant lice is known to all. The red ladybird beetles (*Coccinella sanguinea* Linn.), *C. californica* (Mann.), the black spotted ladybird beetles (*Hippodamia convergens* Guer.), *Hippodamia ambigua* (Le Conte), *Magilla macu-*

lata, the eyed ladybird (*Coccinella oculata* Say) and *C. abdominalis* (Say) are the most common California species.

Chrysophidæ. One of the most common insect predators, preying on all sorts of soft-bodied insects, is the common green lace wing, called Aphis Lion because of its destructiveness to all plant lice (aphids). The eggs, larvæ, pupæ and adults are to be found everywhere in the fields, woods and orchards; wherever there are infestations of plant lice one is almost sure to find the larvæ of *Chrysopa californica* Coq. In the orchards of California they are very abundant and play an important part in the control of many bad pests, but more important in keeping down the aphids which have already been described. When there is no prey on the orchards they go to the fields and brush to seek other game and return as soon as the lice begin to appear.

Internal Parasites.

Internal parasites are those which develop within the body of the host. The adult female, by means of a sharp ovipositor, deposits her eggs within the bodies of the lice. These eggs hatch, and the resulting young develop into legless, maggot-like individuals which live on the body juices of the aphids, thereby completely destroying them. When fully developed, a small hole cut in the backs of the lice liberates the adults, which immediately attack other living lice.

To these parasites, more than to all others, is due the credit of completely controlling many aphids which would otherwise become very destructive. They do not usually get in their work until rather late in the season, after the aphids have done most of their damage, but though late it is sure. Though the natural eneimes are very efficient in a majority of cases, yet all of the real pests (pests because they are not so held in check) must usually be controlled by artificial methods, of which spraying is recognized as the most efficient.

Artificial Methods of Control.

Sprays. Treatment for insects which are both ærial and subterranean in habits naturally calls for entirely different methods for each form. Of the species named above, two stand out as splendid examples of the subterranean form. They are woolly aphid and the black peach aphid, but both of these have ærial generations. The beet aphid (*Pemphigus betæ* Doane) and *Trifidaphis radiculicola* (Essig) Del G. are not known to be other than strictly subterranean in their habits. In considering methods of control we shall take the woolly aphid (*Schizoneura lanigera* Hausm.) as an example.

Methods for Controlling Underground Forms.

Prevention. In setting out a young orchard one of the first things to consider is to prevent the introduction of certain serious pests and diseases which may be carried on nursery stock. Both the peach aphid and the woolly aphid are easily distributed on young trees. The following precautions should be taken in setting out any new apple or peach orchard:

1. Set out clean stock. Do not buy trees which have the roots puddled unless the mud is washed off—it may hide the woolly aphid or black peach aphid and such infested trees would be severely handicapped and are not worth planting.

2. Woolly aphid does very little damage to the Northern Spy; especially is this true regarding the attacks on the roots, therefore, if possible, buy apple trees budded on Northern Spy roots, if your section is troubled with the woolly aphid.

3. Set trees fairly deep, keep soil thoroughly cultivated so as to get roots down as far as possible. The woolly aphid seldom works lower than ten (10) inches below the surface.

Sprays. Before making applications around the crown of the tree for the controlling of root forms, first remove earth around the roots to a depth of six or seven inches and a distance of two or three feet from the crown. Use two or three gallons of liquid per tree, spraying thoroughly on exposed roots. When the liquid is nearly all soaked into the soil cover up the basin. The sprays which have given the most satisfaction in these cases are as follows:

Tobacco leaves. A large number of tobacco leaves placed around the roots of the trees in the fall will do much to keep out underground lice.

Tobacco decoction. Tobacco stems, dust or waste, 2 pounds; water, 3 gallons. Steep tobacco stems in water for at least one hour before applying. If whole leaf tobacco is used, 1 pound is sufficient for 3 gallons of water.

Black leaf. Black leaf in proportions of 1 to 70 of water is also effective on the root forms.

Tangle-foot. If the dormant trees are sprayed with a strong solution of kerosene emulsion or lime-sulphur just before the buds open in the spring, it is well to put a tangle-foot band around the trunk of the tree to keep root forms from migrating to the top. In order to prevent injury to the tree the tangle-foot is smeared on heavy paper, which is placed around the tree in the form of a band with a thin layer of cotton beneath to keep any from crawling under.

Carbon bisulphide. In light sandy or porous soils, carbon bisulphide is used very effectively. The treatment should be made early in the spring about April, as follows: Make 4 or 5 holes 8 inches deep from 18 to 2 feet from the tree. Into each pour from 3 to 4 liquid ounces of carbon bisulphide, and immediately cover the hole. See that the liquid does not come in contact with the roots.

Kerosene emulsion. Kerosene emulsion (see formula below) is often used successfully on the roots, but is rather a severe treatment and should be avoided except by those experienced in its application.

METHODS FOR CONTROLLING AERIAL FORMS.

Winter sprays for dormant trees.

In order to destroy the eggs deposited by the sexual females in the fall, strong sprays should be applied in the winter when the trees are dormant, so as to prevent infestations for the coming year. The following sprays are recommended for this purpose:

HOME-MADE LIME SULPHUR.

Lime -----	15 pounds
Sulphur -----	15 pounds
Water -----	45 gallons

First slake the lime with sufficient warm water and while the mixture is boiling add the sulphur and stir it in, boil over a fire, adding water when necessary, until the mixture changes to a deep reddish brown color. This will require about one hour. For use dilute this mixture to form 45 gallons of spray, which should be applied at once.

Commercial lime sulphur. Commercial "Rex" or "Ortho" lime sulphur should be diluted, 1 gallon to 9 gallons of water.

Just before the buds open in the spring the following sprays are excellent:

KEROSENE EMULSION.		
Whale-oil or soft soap	-----	2½ pounds
Kerosene	-----	10 gallons
Water	-----	40 gallons

Dissolve the soap in 5 gallons of hot or boiling water, add kerosene; agitate thoroughly by pumping through a spray pump back into the original receptacle until a thick creamy liquid results. Add water enough to make 40 gallons.

Black leaf. Black leaf, diluted 1 to 60 of water, will give good results.

Whale-oil soap. For dormant trees dissolve 1 pound of whale-oil soap in every 6 gallons of water, and apply with a good power pump.

Spring and Summer Sprays for Trees and Plants in Foliage.

Sprays for foliage can not be as strong and severe as those used on dormant trees, and care must be taken to prevent serious burnings. In view of this, experience has proved the following formulæ to be practical:

KEROSENE EMULSION.		
Kerosene	-----	10 gallons
Whale oil or soft soap	-----	2½ pounds
Water	-----	50 gallons

(For mixing see above.)

Tobacco decoction. Mix the same as those recommended for root forms.

RESIN-SODA-FISH OIL WASH.		
Caustic soda	-----	1½ pounds
Water	-----	1 gallon
Resin	-----	1 pound
Fish oil	-----	1½ pints

Dissolve all the caustic soda in one gallon of water; to half of this solution add the resin, and boil; when thoroughly dissolved, add fish oil and stir frequently. Add remainder of caustic soda solution and boil for one hour. For use add enough water to make five gallons.

SOAP AND FISH OIL WASH.		
Whale oil soap	-----	1 pound
Fish oil	-----	1½ pints
Water	-----	3 gallons

Dissolve soap in hot water; bring this solution to a boil; add the fish oil and stir thoroughly. Dilute to make fifteen gallons.

CARBOLIC ACID EMULSION.		
Crude carbolic acid	-----	5 gallons
Whale oil soap	-----	40 pounds
Water	-----	40 gallons

Dissolve soap in hot water; add carbolic acid and stir thoroughly. For use, add twenty gallons of water to every gallon of the above solution.

The above sprays should be used on hardy plants and are to be used particularly on orchard trees. While the following formulæ are specially recommended for tender plants, such as melon vines, they are equally good for fruit trees:

QUASSIA.

Quassia wood-----	2½ pounds
Whale oil or soft soap-----	5 pounds
Water-----	13 gallons

Soak the quassia wood over night in one and one half gallons of water; boil well and strain through a cloth; add soap which has been previously dissolved in hot water. Dilute to make twelve gallons of spraying material.

SOAP AND TOBACCO WASH.

Soap-----	1½ pounds
Tobacco decoction (as prepared above)-----	1 quart
Water-----	5 gallons

Dissolve the soap in five gallons of hot or boiling water; add the tobacco decoction; boil together five or ten minutes. If the mixture has boiled down, add enough water to make five gallons of spraying material.

This spray is specially recommended as a remedy for the melon aphid (*Aphis gossypii* Glover).

THE CHAIRMAN. Now, ladies and gentlemen, we have plenty of time to have a thorough discussion of this very important subject. If I may be indulged just a minute, I would like to make one or two remarks—one in regard to the matter of knowing things technically. Some of you say "we want it practical; we don't care for the science of it." But just one thing that Mr. Essig called attention to: He said that this egg is on the plants in winter, and he said wherever the apple is found there you have this plant-louse. Don't you see the point? They are on the plant in winter. That is technical. But see how practical it is. Now, knowing that, if you are getting plants from any part of the world, what are you going to do? You are going to see that those eggs are killed, if present on the plants.

I want to suggest one other thing: He said "Do that thoroughly." A few years ago a gentleman from the south—and we hope he will be here—Mr. Chapman—gave a paper on Treating the Citrus Orchards; and one person said after he got through, "I am not going to do that; I am not an old maid." I tell you I have a great respect for old maids, and I think if he had more old maids about him he would have done more, as Mr. Chapman did. Mr. Chapman, if you notice the accounts, gets from fifty cents to two dollars per box more than anybody else in the New York market for that Old Mission brand of oranges. He says that the reputation is really worth more than the orange itself. I do not think Mr. Essig has put that too strongly. Let us be old maids. Let us do the work the best we can.

We have plenty of time; we have many here who have had experience, and let us have good lively discussions. Who is the first? These discussions should be the best part of our conventions.

MR. TURNER (from Sebastopol). I may say that I took a great deal of interest in Mr. Essig's paper. Being an apple grower for a great many years, and while I am free to admit that we may control the scale and codling moth, I believe that in the aphid we have our worst enemy as

regards the apple, not only on old bearing trees, but also young trees; and I would like to ask, after the aphid assumes the winged form (which I may say I have noticed myself about the first of June), where it goes; that is, in other words, have we any knowledge where it exists from that time on; what other plants it flies to? Of course, this might be an entirely local question, but it is a rather important one, if it could be answered.

MR. ESSIG. Is that the apple aphid you are talking about?

MR. TURNER. Yes.

MR. ESSIG. It leaves the trees about June?

MR. TURNER. Yes, I have noticed it.

MR. ESSIG. I think that is a rather peculiar condition. I have made quite a close study of the apple aphid in Humboldt County, and there it is on the tree throughout the entire summer months, and is the thickest, I should say, during the months of June and July, and on to August. If the true apple aphid leaves the tree in June, it is simply probably migrating to other orchards, because this particular aphid works on the apple throughout its whole bearing season. There are a great number of lice that work on apple trees. There is another aphid which in June, when many of the succulent plants are coming out, will prefer them to the apple tree; and you will easily mistake it for the apple aphid. No doubt the attacks are less in June because these lice are migrating to other plants and to truck crops. This particular louse has a list of food plants of over sixty, and of course if a few of them go to these other host plants it is bound to diminish more on apple trees. That may explain it.

MR. TURNER. My main reason for asking that question was that up to date we do not seem to have been able to get any knowledge as to the habits of the aphid, either green or purple. It is sometimes called purple; whether that is correct or not I do not know. I have heard that term used by a prominent horticulturist. As to the apple aphid: After the aphid assumes its winged form, which it does—take an average season—along about in June, it almost entirely disappears; I might almost say entirely disappears; and I feel interested, very interested, to know as to where it hibernates during the fall and the winter, or in what form—whether it goes to the ground or whether it seeks some other shrub; in other words, if we could get something along that line, it might aid us in fighting the pest.

MR. ESSIG. The work that we are outlining now is to go into the field during the summer time and the early spring when the lice are on the trees, and then follow it into the winter to find out where these lice go. That is a problem that will take some time to follow out, and is something that in the apple orchard I have not followed out as fully as I intend to follow it out. I might say that what I have given this time is simply preliminary to work that we expect to do on this plant louse. But you must take into consideration that you are dealing with a most intricate problem; and I think the best of us are going to get these confused in our own mind, and we are going to swear that a certain louse is what it is not, and we have to know the life histories of a great many of them before we can state positively what to recommend for a particular louse, and that is the reason why I have not gone into this here. I do not know your conditions.

MR. TURNER. I think your paper bears out our conditions, because I myself have observed the egg form and the development, the egg hardening and becoming black; I have noticed it particularly on young trees, grafted trees, for instance, very strikingly; and I might say that I have had a few practical experiences a few seasons ago that might be of value. It bears out what you say—that when the insect gets out of the egg form it seeks the direction of the young bud just coming out. I have had a great many trees pruned and find I can not get them well pruned just when I like to. I pruned a block of trees rather late a few seasons ago when the trees were out in leaf; it was in March; it had no bad effects, but it had a natural tendency, as you all know, to mold. The lower buds were held in check, when the rest of the orchard was all out in actual leaf. The year previous that block of trees had been badly infested with aphid; in fact, they were sights; and immediately after pruning those trees—I was spraying the rest of the orchard at the time and I was using a strong lime and sulphur solution—I am a great advocate of lime and sulphur—I sprayed those trees, as I may say, very thoroughly. With trees in that condition I presume that these young lice just hatched could not get any protection anywhere on those trees. While I did not notice them, I feel like saying they must have been more or less exposed, and I just simply annihilated them, and that same year I sprayed very late. I afterwards discussed the matter with Mr. Volek at Watsonville, and Mr. Newcomb can bear me out in this, because he was through the orchard later. I sprayed the leaves when the buds were quite well advanced, with high pressure, the lime sulphur solution very strong—ten pounds of lime to 100 gallons of water—with the result that I thought I burned up my entire crop; the trees looked like a fire had swept through them; but the result I got was surprising. I practically had no aphid; almost had it under absolute control. They were large trees, some of them forty or fifty years old—some of the oldest in the district—and the quantity of apples secured I never had before or since. I spoke to the professor about it and he said that I got the result from the late spraying; and from that time I have been an advocate of late spraying and intend to practice it; and I believe that any one that wants to do the best and get the best results from spraying wants to spray late, particularly in this section—that has been my experience with the lime sulphur solution—as late as they can without doing any lasting damage to the trees.

MR. BOWMAN (of Placerville). I would like to ask Mr. Essig if the aphid known as the green and purple in California are the same species, or are they technically known under different names? Mr. Volek got out a little paper about the purple, and we speak of the green apple aphid, and I would like to know whether they are the same.

THE COMMISSIONER. I am going to call upon Mr. Volek to answer that question because he has published an article on it.

MR. VOLCK (commissioner of Santa Cruz County). They are two very distinct species, and Mr. Essig has given the life history of the green aphid. The life history of the other aphid is not fully known. I believe it has been claimed that eggs are laid on trees in small numbers, and I think that is the most logical conclusion, because in the spring they are isolated and composed of single individuals, which would indicate that they came from eggs which were likewise isolated and not in bunches like the green aphid eggs. In regard to the control of this aphid, I think that Mr. Gallagher of Agnews was about the first man to observe that the

strong lime-sulphur solution used rather late in the season did control the aphid. I later verified his experiment, and Mr. Gallagher also verifies it, so that we know how to control the purple aphid. It can not only be destroyed with strong sulphur and lime solution, but also by oil emulsion. In regard to where these go, that is also problematical. The winged form has no definite object. They are not capable of reproducing the species in any way.

THE CHAIRMAN. Time for further discussion—Mr. Garden.

MR. GARDEN (of San Joaquin County, county commissioner). The question I was going to ask was asked by our friend and fully explained—in regard to the eggs.

MR. STEPHENS (of Sacramento). I would like to ask what the difference is between the aphid you are discussing and what you might call the prune or plum aphid; are they anything like any other aphids?

MR. ESSIG. Yes; the common plum louse is a good deal like this louse.

MR. STEPHENS. My experience has been that there is a parasite for that aphid which might explain its disappearance along the latter part of June. Of course, the parasite does not exist to any great degree until it gets its food, and the green aphid has to multiply considerably before there is anything for the parasite to subsist upon; and unless that parasite has plenty of food, it destroys to a very great degree the aphid and apparently they disappear. You know the name of that parasite; the scientific name I can not recall, but it multiplies very rapidly after the aphid appears, and frequently, my experience has been, it would almost wholly annihilate the aphid, which would explain possibly, if there was a parasite for the apple aphid, its disappearance in the same way.

MR. HOTLE. I have had quite an experience with this purple aphid, as that is what we have been told it is. It is quite strongly colored purple and I have discovered that in the month of June, about the middle of June, that aphid takes wings, and I never saw one of them fly, but they will go right down the body of the tree into the ground. In regard to parasites: It is supposed the ladybug is a parasite for this aphid, and I think it is; but the aphid increases so fast that you could not ship ladybugs into Sonoma County fast enough to eat them up; it is absolutely impossible. Now, they are a very difficult thing to get rid of; in fact, at the present time we have not been able to get any definite information as to a positive remedy for getting rid of them. We have sprayed with black leaf and whale-oil soap, which is supposed to be one of the best sprays used; but the question is to know just when to use it, and so far we have not been able to make a complete success in that respect. But I believe from my little experience that the time to spray for the purple aphid is just about the time the leaf bud is bursting. The whale-oil soap and black leaf will kill the aphid if you can get it on it; but if you take a power outfit and put your pressure to 200 pounds, after the aphid is once on the tree, because the leaf is curled three or four different times, it is absolutely impossible to get that spray on the aphid. I have tried it time and time again. I remember quite well one day while we were spraying, there was a little twig about a foot long, possibly twenty leaves on that little branch, and it was just covered with aphids, and I said to my man: "When I get the pressure up to 200, I want you to turn the nozzle on that little branch and we will see what we can do with it. You hold the nozzle about a foot away from the branch, on the top of each side,

underneath and on the end," and I know we put fully a quart of spray on it; and after it quit dripping I went and cut the limb off, and I want to tell you that with the exception of two or three leaves that the pressure of the spray tore off, as far as the aphids were concerned, they did not know they were getting a bath. Now, this aphid is a great deal more detrimental to us than everything else and every other insect that we know anything about. If the aphid gets on a tree, and gets well started on the tree, your crop of apples is absolutely ruined. Now, what we would like to know, if there is any one here to give us that information, is just when to spray. I feel satisfied we know what to spray with; I feel satisfied that the black leaf and whale-oil soap will do the work, but there is just a certain time you have to do that, and if you do not do it at that time, you have absolutely thrown away your money and your time. But your work must be thorough; lacking thoroughness is the great trouble with the majority of the men that do spraying.

THE CHAIRMAN. Any one else wish to speak?

MR. ESSIG. Professor C. P. Gillette of the Experimental Station in Colorado, I think, has done more work on orchard plant lice than any other man in the world, and his recommendation for spraying for the apple aphid is, just before the bud opens, and to give them a good thorough spraying at that time. In the case of the aphid that I have just given a description of, the eggs hatch before the buds actually open, and the young must roam around for some time before they seek and obtain their food. Now, an application of spray just at that time will get every one of those aphids, and I think that just before the buds begin to open is the best time of the whole season to spray. It may be advisable in some seasons to spray just before that period with a strong solution of lime and sulphur, and afterwards when the leaves have come out; but certainly the most important time to spray for plant lice, as outlined by all the men who have done the best work, is just before the buds have opened.

MR. GRIFFITH. I do not wish to speak in the sense of making a speech, because we have too little time. I only wish to emphasize a few points. Mr. Hotle's experience somewhat corroborates my own, that we have wasted a good deal of time and money on this green aphid. So far as tobacco spray is concerned, I have learned to use tobacco, and as to power killing them, it seems almost impossible to get the power sufficiently effective, and if we do, I would like to have somebody else buy the hose; and I am satisfied that unless we find the time adapted to this treatment, we are wasting our money on the spray; and, as my friend says, we have more trouble with the apple aphid than all the other combined troubles with the apples. My experience has been that we are not warranted in using the spray unless we can find a better way of application.

There are one or two other points I wish to emphasize, and that is regarding the trees coming from the nursery in ball form, matted in mud. I think it would be a good rule for the commissioners to eliminate all these trees wrapped up in balls, and, in fact, I think it would be well to have the nurserymen wash off the roots. In that way we are protecting the lice and aiding the distribution of the insects, and we are not forcing upon the grower what he does not understand and can not find; whereas, if they were washed out, there would be a chance to detect these insects and prevent their distribution. In regard to the woolly aphid, there are a great many points to be brought out there;

a great many points in regard to soil and resistant stock, and about planting the trees deep. In my experience it has not been well to plant the trees deeper than they would naturally grow. There may be too much moisture for the roots, or it may be the fact that the ground is in bad condition, and the trees will make new growth at the top. Those things may benefit the woolly aphis. As to the resistance of roots. Some are more resistant than others. We can not tell which is going to be resistant. That root graft business is a very difficult matter to make any success with, because there is a nursing root down there that stays and that will be contaminated. You will have the same aphis trouble with this nursing root. I am satisfied with my experience, and that of a nurseryman who is a near neighbor of mine, that it is very seldom that the cane above the nursing root takes root during the time it is in the nursery; it has to take root above this nursing root in order to be a resisting root; it will not take root within two years. That nursing root is no more than an ordinary seedling, and unless that can be eliminated the resistant root is only an extra expense. If a man could grow his own nursery stock long enough to establish his root and then cut off the nursing root, he would have the true resistant root. I believe that the Northern Spy is more or less resistant, but very slow to come into bearing, which makes it additionally expensive. My experience is that it takes extra time to get the resistant root established on the wood, and a man, if he has the money to get resistant orchards, has to wait until he gets that result.

THE CHAIRMAN. I want to call attention to one thing here: It seems to me that we all must see that there has been a wrong impression in regard to scientists. If Mr. Turner, Mr. Hotle, and Mr. Griffith are not scientists, I do not know who are. What is a scientist? It is a man that gets at the truth, and that is just what we want to know, and we are certainly under obligations to them.

AFTERNOON SESSION—FIRST DAY.

THE CHAIRMAN. The next thing in order is the appointment of committees. I only know of one committee, and that is the Committee on Resolutions; and on the Committee of Resolutions I will appoint Mr. Beers, Santa Barbara; Mr. C. E. Hotle, Sebastopol; Mr. Geo. D. Kellogg, Newcastle; and Mr. K. S. Knowlton, Bakersfield.

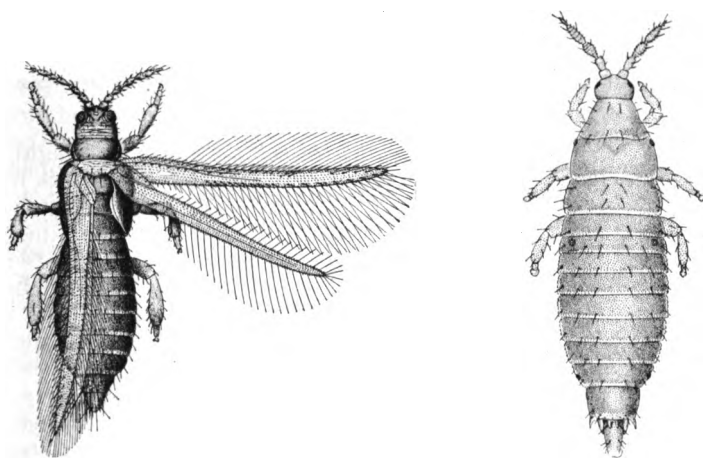
We are ready now to start on our regular program of the afternoon. The first subject is one of paramount importance in the south and in the north, "Thrips," by G. E. Merrill, Chief Deputy Horticultural Commissioner.

THE PEAR THRIPS IN CALIFORNIA.

History.

MR. MERRILL. *Mr. Chairman and Members of the Convention:* In the spring of 1904 some of the orchardists of Santa Clara Valley noticed that the blossoms on their fruit trees did not open as they should. A closer inspection showed that the failure of the blossoms was due to the ravages of a minute insect, many specimens of which

could be observed by shaking the infested twigs against the hand. This insect was later described by Miss Daniel of the University of California in *Entomological News*, and was named by her the pear thrips (*Euthrips pyri*) as her specimens were taken from pear trees. Although our earliest authentic records of the insect date only from 1904, we have reliable reports from orchardists and others that the phenomenon of the blasted buds had been observed in some sections of the valley several years prior to the date named. Just how long the pest has been present in California and how it came to be here are matters of conjecture. There are strong reasons for believing it to be a native species. On the other hand, there are other reasons, probably equally strong, for the belief that it is an introduced pest. Personally, the writer is inclined to the opinion that the insect is a native form, the marvelous prosperity of which during the past few years can be accounted for by an abundant food supply and other conditions favorable for its rapid development.



Pear thrips (*Euthrips pyri*); a, adult; b, larva. Greatly enlarged. (U. S. Dept. Agrcl.)

Distribution

The pear thrips is at present generally distributed throughout the fruit-growing districts of the Santa Clara Valley, the counties around the San Francisco Bay region, and parts of Yolo, Sacramento, and San Joaquin counties. The insect is spreading rapidly, and it is probably only a question of time before it will become generally distributed throughout the deciduous orchards of northern California. The pear thrips has also been found in England and in New York State, where it promises to become a serious pest of the pear tree.

Damage.

The damage done by the pear thrips is caused by its eating and egg-laying ravages on the tender tissues of the expanding flower and leaf buds, and later by the attacks of the larvæ, or white thrips, on the young fruit. In badly infested orchards, the work of the pest is so quickly and thoroughly done, that the buds have no chance to open. At the time when the blossoms of these orchards should be at the height of their beauty, a brown, fire-swept appearance is presented, and not

until the larvæ have disappeared beneath the surface of the ground do the trees appear in their customary springtime garb of green. Under these conditions practically no fruit is matured. In orchards less badly affected much fruit persists on the trees, but does not come to a normal maturity. In the case of prunes and plums, a large percentage of the fruit will present a scabbed appearance when matured. With pears the fruit may be scabbed and curled, or otherwise badly deformed. Although the pear thrips attacks nearly all of the deciduous fruits, most of its damage is done to prunes, pears, and cherries. There are but few cases on record of serious damage to peaches, apricots, or almonds. The hairy surface of these last-named fruits seems to protect them to a certain extent from the voracious appetites and injurious egg-laying habits of the species.

The amount of damage done by the pear thrips during the past seven years has been conservatively estimated by agents of the U. S. Department of Agriculture at seven millions of dollars. In this estimate no account is taken of the cost of spraying operations, and other means exercised for the control of this insect pest, probably the most serious one that to-day confronts the deciduous fruit grower of our State.

Life History.



Pear thrips (*Euthrips pyri*); head and prothorax from side to show mouth parts. Much enlarged. (U. S. Dept. Agrcl.)

Before any insect pest can be fought intelligently, knowledge of its life history is of prime importance. Early in the spring, just when the buds are beginning to swell, the adult thrips make their first appearance on the twigs and buds. In the Santa Clara Valley the thrips are usually first noticed about the middle of February. From the time of their first appearance the number of adult thrips in evidence rapidly increases until late February or early March, when a rapid increase is noted. However, the latest thrips may not leave the ground until early in April. As many as 400 individuals have been taken at one time from a single cluster bud of cherries or prunes. From 50 to 100 thrips per bud are frequently present throughout a badly infested orchard. By the time the scales on the buds have separated enough for the thrips to squeeze in, in they go to feed on and otherwise to injure the tender tissue within.

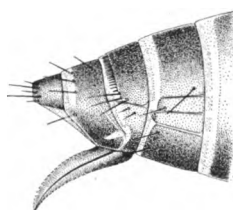
Kipling's line, "for the female of the species is more deadly than the male," is incontestably true of the pear thrips, for they are all "lady" bugs. No males have yet been found. A profile view of an adult thrips, showing mouth parts and ovipositor, is shown in the cut. Just as soon as an entrance is forced into the bud, the insect begins to feed. Thrips does not feed like cows, by biting off and chewing its food, instead it rasps an opening through the skin of the leaf or blossom tissue, inserts its beak and partakes of the life juices of the plant. After a few hearty meals, the thrips is ready to begin another branch of its life activity, that of egg laying. To lay an egg, a thrips rasps a hole through the skin of the tender plant tissues with her saw-like ovipositor, which is then inserted in the opening as deeply as possible. An egg is then passed through the ovipositor and imbedded in the growing tissue. A great deal of the damage caused by thrips is due to

the effects of ovipositing, especially in the case of cherries and other fruits with long, tender stems. A few thrips eggs placed in a cherry stem will so weaken it that the fruit is caused to drop. Thrips lay better than *Petaluma* chickens. From 50 to 100 eggs per thrips are laid during the active adult stage of three or four weeks' duration, a record of which any hen might well be proud.

The eggs themselves are small, bean-shaped objects, from which the young thrips, the so-called "white thrips," emerge in from four to fifteen days. Usually about eight days are required. The larvæ feed on the blossoms, opening buds and young fruit in much the same way as the adults. They increase rapidly in size and at the end of three weeks they become full grown and fall to the ground. Here they penetrate the soft layers of soil and enter the compact subsoil or plow pan to the depth of three or four inches. The depth at which the larvæ come to rest depends largely upon soil conditions. In loose, sandy or gravelly soil, a depth of two or three feet is sometimes attained, but in heavier, more compact soils the majority of the thrips are found within twelve or fourteen inches of the surface. As soon as the thrips have come to rest they form a little cell about themselves and remain quiescent throughout the rest of their larval and pupal stages. Pupation takes place in September, and pupæ are most abundant in the ground during October and November. Throughout the latter month, and in December, the pupæ transform to adults, which gradually become more active, as the season advances, until they are ready to emerge at the first indication of spring. The number of adult thrips per square foot of soil varies, of course, with the intensity of the infestation. As many as 4,000 thrips per square foot have been taken from badly infested ground. From 200 to 500 thrips per square foot are enough to create a serious amount of injury.

Control Methods.

The control of the pear thrips was one of the most difficult problems ever presented to economic entomologists for solution. Ever since 1905 a large part of the time of from one to seven experts of the U. S. Department of Agriculture, besides the time of several other economic entomologists has been devoted to a study of the pest, and the means of controlling it. As a result of the work of these investigators have come two methods of control, or rather, spray formulas, (1) the Government formula and (2) the lime spray, both of which seem to give good results under certain conditions.



Pear thrips (*Euthrips pyri*); end of abdomen and ovipositor from side. Much enlarged. (U. S. Dept. Agrcl.)

Soil Fumigants and Cultivation.

As the greater part of the thrips life is passed in the ground, it was at first thought that the insect could be best attacked there. To this end soil fumigants, fertilizers, and the flooding of the ground for various periods was resorted to, with but little encouragement. Any fumigant that would kill the thrips was either too difficult of application or too expensive to be practicable. The thrips seemed to thrive in water-soaked ground, and complete immersion for periods of six days or

more had absolutely no effect on their subsequent activities. The results attending cultivation experiments were more pronounced, and by thorough plowing and cross-plowing the number of thrips in the soil of some of the orchards in the Santa Clara Valley was reduced from 50 to 70 per cent. Plowing, to be at all effective, must be done when the thrips are in the pupal stage, as they are then very easily injured, and the slightest disturbance will kill them. The plow must also be set deep enough to break up the first three or four inches of the hard soil or plow-pan. To do this in most orchards in the Santa Clara Valley, the furrows turned must be at least eight or ten inches in thickness. The difficulties attending this depth of plowing are obvious to any practiced orchardist. After the land is plowed and cross-plowed, it must be well harrowed in order thoroughly to break up and pulverize the clods and lumps. In soils where a large proportion of the thrips are found at a depth of sixteen inches or more, the futility of this treatment is apparent. Even where more than half the thrips present are killed, enough survivors may be left to cause a total failure of the crop. Thorough cultivation can do no harm and in many cases the orchard will be benefited, both from the direct effects of the cultivation and indirectly from the thrips killed. In badly infested orchards, however, plowing and cultivation can be relied on at best only as a supplement to a more efficient control by spraying.

Spraying.

In the early experiments of the department, a large number of different insecticidal sprays were tried out. All poison sprays were failures, because of the peculiar feeding methods of the thrips. Sticky sprays were difficult of application, and did not long retain their sticky character after application. Dust sprays failed to kill. Sprays, whose insecticidal properties depend on caustic soda, carbolic acid and other caustic materials, were a success in so far as killing the thrips went, but their use was inhibited because of their harmful effects on the blossoms, foliage, and fruit. Distillate oil emulsions, when sufficiently strong, were effective in killing the thrips. They also injured the foliage. Early in the work the efficacy of various tobacco washes was noted, but the insecticidal powers of these washes were soon dissipated by evaporation, and at best they lack the quality of penetration; that is, to force them into the expanding buds was difficult. Finally came the idea of combining a weak distillate oil emulsion and a tobacco wash. From this idea was developed the Government formula which is to-day giving good success when applied in the right way under certain conditions.

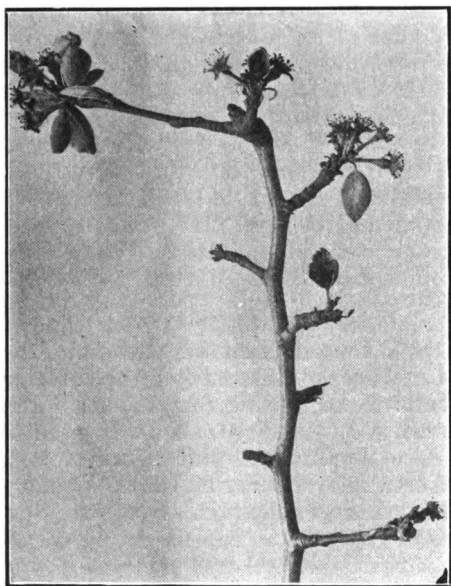
Government Formula.

The formula which has given the best results is made up of 3 per cent distillate oil emulsion, to which is added from 1 per cent to 1½ per cent of Tobacco Extract No. 1 (black leaf containing 2.75 per cent nicotine) or Tobacco Extract No. 2 (sulphate of nicotine or black leaf 40) which is 40 per cent nicotine, at the rate of one part to from 1,500 to 2,000 parts of the spray mixture. The distillate oil emulsion may be obtained from several dealers in chemical and spraying supplies, or may be made at home. By the use of the home-made emulsion, a considerable proportion of the cost of spraying is saved and, what is more important, the quality of the emulsion is above reproach when good

materials are properly used in its manufacture. The stock emulsion can be made several weeks previous to the time of spraying, if necessary. The first step in the manufacture of the emulsion is the making of the soap according to the following formula, which will give, when properly mixed, about 40 pounds of fairly firm soap.

Water	6 gallons
Lye, 98 per cent.....	2 pounds
Fish oil.....	1½ gallons

To make the soap: Place the water in the kettle or caldron and add the lye. When the lye has been dissolved and the water is boiling hot, add the fish oil. Boil the mixture gently for one and one half or two hours, or until it presents a ropy, stringy effect when allowed to drip from the ladle. One of the secrets of success in the making of this soap is the



Pear thrips injury to buds of Bartlett pear.
(U. S. Dept. Agrcl.)

use of the genuine fish or whale oil. A mixture of fish and mineral oil will not do. This fact should be impressed on the mind of the dealer from whom the oil is purchased, so that no attempt at substitution will be made. With oil at 35 cents per gallon, the cost of the soap should be about one and two thirds cents per pound.

To make the distillate oil stock emulsion, the following formula, or some multiple thereof is used:

Hot water	12 gallons
Fish or whale-oil soap	30 pounds
Distillate oil	20 gallons

No one should attempt to make this emulsion without the use of a power sprayer, with a good agitator. For a 200-gallon tank, five times the amount of ingredients named above are necessary, if a full 200 gallons of stock is to be made. The water should be boiling hot when put into the tank. As soon as the water is in, the agitator must be started

and the soap immediately added. Just as soon as the soap is dissolved, the oil must be slowly added, in the mean time keeping the agitator at work. After the oil is well mixed with the soap and water, the contents of the tank should be passed through the nozzles at a good pressure (175 to 200 pounds) into storage tanks or barrels. The passage through the nozzles is very essential for the securing of a good emulsion. Other essential points are, reasonably exact measurements, boiling heat for the water, and the right kind of distillate. In fact, good results in the orchard depend absolutely on the quality of the distillate. The oil should test 32° to 34° (Baumé) and should be the raw, untreated distillate, comparatively free from naphtha and with a high flash point. Indeed, the best results are derived from the use of a raw, short cut distillate; that is, a distillate from which the lighter hydrocarbons, gasoline, naphtha, etc., have been removed. Oils of this character are put out particularly by some of the Bakersfield and Coalinga oil companies.

Where the water is unusually hard, the use of caustic soda or more soap than the formula calls for may be necessary in order to soften it. The stock emulsion made according to the foregoing formula contains about 55 per cent of oil, and should cost the maker about 5 cents per gallon. To make a 3 per cent emulsion for use in the orchard, about 5½ gallons of stock emulsion should be used for each 100-gallon tank. The stock emulsion should be first placed in the tank, and the water should be added under constant agitation. The tobacco extract should be the last ingredient added to the mixture.

Interior Valley Spray.

Owing probably to different climatic conditions, the use of a larger amount of tobacco extract is necessary in the interior valleys than in the Santa Clara Valley. In the interior valleys, Extract No. 1 should be used at the rate of one part to 60. No. 2 is used at the rate of one part to 1,500, or a little more than a pint of extract to a 200-gallon tank full of spray mixture. In the Santa Clara Valley good results are secured by the use of smaller amounts. No. 1 may be diluted 1 to 75, and No. 2, 1 to 2000.

Treatment Advocated.

Where the orchards are badly infested more than three applications are rarely necessary except in the case of pear orchards, where a greater number may sometimes be advisable. The first two treatments are for the adult, the third for the larvæ. The first application should be made just as the thrips begin to enter the separating buds. In this treatment, as in all others, a rather coarse, driving spray should be used, at a pressure of not less than 175 pounds to the square inch. Particular pains should be taken to shoot the spray into the expanding buds. To do this the nozzle must be held rather closer than usual to the twigs and buds. Except with very small trees, a tower on the spray outfit and a third lead of hose are absolutely necessary.

The second application should be made from four to ten days later when the tips of the petals begin to appear. This treatment should be made in the same thorough manner as the first. The third treatment for the larvæ should be made after the petals have fallen, and particular pains should be taken to reach the under side of the young leaves before the upper sides are touched. If the upper side is hit first by the spray, the larger part of the larvæ will be knocked to the ground without com-

ing in contact with the spray. A somewhat finer spray may be used in this treatment than in the first two. So far as possible, spraying when the trees are in full bloom should be avoided.

The treatment above outlined is particularly applicable to prunes, cherries and pears, when the bloom is fairly uniform in its development. In orchards where the bloom is irregular in making its appearance, or is spread over a long time, some modification in the outlined schedule may be necessary; that is, more spraying may be required, or it may be impossible not to spray when some of the bloom is in evidence. Good results from this treatment have been obtained upon cherries, pears and prunes. However, the pest is more difficult to control on pears than on prunes, and on prunes than on cherries.

Results of Treatment.

Early in the Government investigations the fact became plain to the men in charge of the work that not all the shortage in the Santa Clara Valley was due to the thrips. A poor physical condition of the trees, caused by a lack of plant food or water, was responsible for much of the damage laid by some to the thrips. The ravages of the thrips were also more pronounced on these poorly nourished trees. Accordingly the application of fertilizers to some of the thrips-infested orchards seemed desirable. Such applications were made in much of the demonstration work in the Santa Clara Valley.

The writer of this paper is greatly indebted to Paul R. Jones of the U. S. Department of Agriculture for the following facts and figures relating to the demonstration work for the season of 1911. In connection with this work, it is only fair to state that the thrips conditions in the Santa Clara Valley this year were not as bad as in some previous years. This state of affairs may be accounted for by the heavy rains at blossoming time in 1910, which probably washed many immature thrips to the ground, where they undoubtedly perished, and by the abnormally dry fall which may have interfered with the proper development of the insect at the time of pupation and change to the adult form. In consequence of these conditions, the results of the demonstrations here detailed are not so pronounced as they would have been had the thrips infestations been as severe as was anticipated.

In the prune orchard of Mr. H. Curry, three plats were laid off. Plat No. 1 was sprayed twice and fertilized. Plat No. 2 was sprayed twice. Plat No. 3 received no treatment. The cost of the two spray applications was \$13 per acre, and \$20 worth of fertilizer was used on plat 1. The yield of this plat was at the rate of 635 boxes of green prunes per acre. Making proper allowance for shrinkage in curing and figuring on a 5.75 cent basis price per pound for the dried fruit, the product of this plat was worth \$513 per acre. The yield from plat 2, sprayed only, was 593 boxes per acre, worth \$471; from plat 3, the check, 486 boxes per acre were obtained, valued at \$391. The gain due to spraying in plat 2 was \$67 per acre, and on plat 1, after making allowance for the \$20 worth of fertilizer used, \$89. The foregoing figures may not sound very impressive, but it should be remembered that the effect of the treatment is cumulative, and the next year the spray portion of Mr. Curry's orchard ought to be comparatively free from thrips. On the other hand, the unsprayed portion will probably be badly affected, unless all signs of an abundant crop of thrips next year fail.

Mr. Fellows, of the Quito ranch, is also an earnest believer in the efficacy of the spray in his prune orchard. During the past season he sprayed his entire prune orchard of 250 acres twice, and 195 acres of it three times. The total cost of his spraying operation on 195 acres was \$2,577.82, divided as follows:

Labor, 235 days, \$2 per day-----	\$470 00
Horses, 210 days, \$1 per horse-----	210 00
Commercial emulsion, 89½ barrels at \$6.10-----	581 75
Black leaf, 55½ 5-gallon cans at 90 cents-----	249 70
Black leaf 40, 45.2 at \$12.50 per gallon-----	565 00
Gasoline, 144 gallons at 15½ cents-----	22 32
Lubricating oil, 20 gallons at 45 cents-----	9 00
Cartage-----	45 00
Interest and depreciation of outfit-----	425 00

\$2,577 82

The black leaf was used at the rate of 1 to 100. Black leaf 40 used at the rate of 1 to 2,000. There were 90 trees to the acre. Each application cost nearly 5 cents per tree, or about \$13.50 per acre for the season's spraying of three applications. The yield of the 195 acres for the year 1910 was 222 tons of green fruit, a large part of which was scabby. The yield from the same 195 acres in 1911 was 648 tons green fruit of good quality. Figured on a 5 per cent basis, making an allowance of 2½ to 1, the 1910 crop was worth \$11,800, or about \$60 per acre. The 1911 crop was worth \$34,450, or about \$176 per acre. Mr. Fellows attributes this net gain of \$100 per acre almost entirely to spraying. He is going to purchase two more spray outfits, making six in all, so that, if necessary, he will be able to make timely application on the entire orchard the coming spring. Even more decisive results on pears than on prunes in the county of Santa Clara could be shown, were there time to do so.

Mr. T. W. Dean, Courtland, Cal., is another grower who has made use of the Government formula. He made good, thorough applications on pears, peaches, plums, and cherries. He does not fear the pest in plums, peaches, or cherries, and is confident that he can control it on the pears when the buds open uniformly. He notes that his crop from the tops of the pear trees (he did not have a tower on his spray outfit) was inferior in quality and quantity to that of the lower limbs, which received a thorough application of the spray.

Instances of the sort given in the foregoing could be multiplied indefinitely. In this connection, however, it is only fair to state that some men who have sprayed conscientiously and thoroughly have not obtained the desired results during the past season, particularly on pears. These individuals and others should bear in mind that the results are cumulative, and that another year of spraying will probably place the pest under control.

Lime Spray.

Mr. Morris, the county horticultural commissioner of Santa Clara County, reports that he has had excellent results on pears with a simple whitewash spray. His solution is made by slaking lime in water, using as concentrated a solution as it is possible to apply, from 75 to 100 pounds of lime to each 100 gallons of water. Care should be taken to secure first-class lime and to slake it well. The cost of this spray, all made up, should not exceed one cent per gallon. The spray should be applied just as the buds begin to separate, and the entire surface of

the tree should be covered. One application is sufficient. Although Mr. Morris gives no exact statement of the results, he assures me that eight times as many pears per tree were taken from the sprayed trees as from the unsprayed trees.

Testing for Thrips.

Many growers are puzzled to know whether or not their ground is infested with thrips. For the benefit of these and others who wish to know just how badly their soil is infested, the Government method of determining the intensity of the infestation will be demonstrated. To secure a sample of the soil the loose layer, to a depth of three or four inches, is scraped away, and a five-gallon oil can, from which the top has been removed, is inverted on the hard soil thus exposed. The soil is then removed from the edges of the can, which is sunk to its full capacity over a section of soil. When the can is sunk as deeply as possible, the enclosed section of soil cut off at the bottom, the can turned right side up and transported with its contents to the place of examination. A section of the soil six inches square is then examined by passing small quantities through a screen. If the thrips are in the larval or pupal stage, black paper is used to collect the soil particles passed through the screen. If the insect is in the adult stage, white paper is better. A record is kept of the number found from each inch of soil examined, from which an estimate of the number of thrips per square foot may be obtained.

Summary.

If your orchard is infested, you ought to spray early, thoroughly and late. The results the first year may not be decisive, but at the end of two years of intelligent spraying, the pest will be under control.

THE CHAIRMAN. Now, my friends, this subject is before you, and I hope we will have a good, vigorous discussion. Let us have your experience and, please, ask any questions that may occur to you.

MR. BOWMAN (of Placer County, commissioner). I would like to ask Mr. Merrill if there is any distinguishing characteristic readily noticeable between the pear thrips and the ordinary thrips.

MR. MERRILL. Yes, to the person who knows the two, but for a novice I think it would be difficult—that is, a person might just know they were both thrips.

MR. BOWMAN. No different colors?

MR. MERRILL. Some are much darker than others. Pear thrips are pretty uniformly a dark brown.

MR. BOWMAN. I would like to ask one more question; that is, regarding the pear: Is it necessary to use a high power?

MR. MERRILL. The pressure, you mean?

MR. BOWMAN. Yes.

MR. MERRILL. Yes. We have found it a great deal more successful to use a heavy pressure—from 175 to 200 pounds to a square inch—for the reason it is pretty difficult to shoot it into the expanding buds. We can not even do it then sometimes, but that will do it better than a lower power, say, 100 or 80 pounds.

MR. CRAIG (of Santa Clara County). I would like to ask Mr. Merrill if he has investigated any with the burning of sulphur, and what the result was?

MR. MERRILL. I think that the Government tried that out and condemned it. I personally have never investigated the burning of sulphur except through reports of people I have talked with; and I have met some people that have expressed themselves satisfied with the result, but in no case was I convinced that the facts would back up their view; I think they were simply making a mistake in judgment.

MR. CRAIG. I want to state that a neighbor of mine, Mr. J. P. Thomas, living in Union District, about eight miles from Santa Clara, tried burning sulphur, and he claimed the result was very satisfactory. He did it very thoroughly about three or four times—three, I am sure—and he very carefully, after each burning, went through his orchard, about fifteen acres. He took little buds from the various trees and put them on a white piece of paper and counted the dead and live thrips. He tells me that he got 75 per cent to 80 per cent of the thrips dead. The result was that he had an excellent crop, I think a full crop, while many of us in that neighborhood had little or nothing. Whether the sulphur did it, or whether something else did it, is a question. The sulphur is inexpensive. I am going to try it myself this year. I tried it on about ten or twelve acres of my orchard last year. I got frightened because the effect of the sulphur on some little tender trees I planted where the prune trees had failed to come were that it turned the leaves yellow. I only used it once, but I found out afterwards that these trees came out all right. On that part of the orchard where I burned the sulphur I had a third of a crop; on the balance of my orchard I don't think I had one twentieth of a crop.

MR. SMYTHE (from Napa County). I would like to ask Mr. Merrill how early Mr. Morris sprayed with the lime spray?

MR. MERRILL. He sprayed—I don't know the exact date, but just as the buds began to separate; the tips of the buds were beginning to separate just when the thrips were about to enter. He tried to get it on when the thrips were in the maximum numbers. Of course, when the thrips get into the buds you can not do much. The idea is to keep them out, and you postpone the spraying as late as possible.

MR. SMYTH. One more question: How can you apply the strong solution of lime, 75 to 100?

MR. MERRILL. I think he uses a little coarser opening, but that lime is practically in solution. If you get a good, strong lime it is just like whitewash. Of course, you want to strain it before you put it into your tank, and it wears down the nozzles more rapidly than the other spray, but that is not a great item of expense. They use a variety of nozzles, the Bordeaux nozzle and others.

MR. SMYTH. What proportion of the thrips is calculated to be killed with that method?

MR. MERRILL. He did not kill any directly. It is a sort of starvation method. The theory is that the thrips have a sticky foot and get balled up in the whitewash and can not get into the bud. That is the theory.

MR. RUNYON. Do Mr. Merrill or the Government recommend the lime spray?

MR. MERRILL. Mr. Morris recommends that.

MR. RUNYON. What do the government men say?

MR. MERRILL. I do not think they have tried it out thoroughly. They have made no report particularly on that spray.

MR. RUNYON. Have they made any examination so that they can tell?

MR. MERRILL. I think they have tried the spray down there.

MR. RUNYON. Do they recommend it?

MR. MERRILL. They have seen nothing yet to cause their recommendation of it. They are going to be tried out side by side this year. After this year we ought to get a better line on what they will recommend.

MR. RUNYON. How will the growers get a line on what to use?

MR. MERRILL. Use their judgment. Personally, if I were spraying, I should try them both. Try them side by side and convince yourself. I expect to do that. If we can find somebody with an orchard in which they are willing to let me try them, and I have no doubt we shall do so, we shall try that out. I will say that other men who have tried the lime spray condemn it.

MR. RUNYON. How about using carbolic acid and lime?

MR. MERRILL. I have talked with Mr. Morris on that point, and he did not recommend that. He stuck right straight to the whitewash.

MR. RUNYON. Do some of them use lime and carbolic spray?

MR. MERRILL. I think they did, but not to a great extent.

MR. RUNYON. I heard that it burned the tree.

MR. MERRILL. It is very apt to. We tried carbolic spray, not particularly with lime, but carbolic and other things, and we got injury to the tree with the carbolic. That would be one of the objections to the use of carbolic acid.

THE CHAIRMAN. We will be glad to hear from Mr. Morris on this lime spray. We would like to have these things first hand.

MR. MORRIS. I just this minute stepped into the hall and I do not know what you are talking about.

THE CHAIRMAN. It is the lime spray, a strong solution of lime for the thrips.

MR. MORRIS. Is this discussion following the paper of Mr. Merrill?

THE CHAIRMAN. Yes.

MR. MORRIS. I do not think that I have anything to say, at least in an impromptu manner, concerning the lime and carbolic spray for thrips on prunes. I have been suspending judgment on that for reasons that might not be of interest to you now. But I have this to say concerning the work on pears. I have experimented two years with the lime spray on pears on an orchard over by Mr. Bogen in Santa Clara Valley, and both years I have succeeded in a way that I am glad to tell you about. First, I would say, however, that the lime alone has to do about the same sort of work as the lime and carbolic; therefore, I will dismiss the carbolic and lime proposition and speak of the lime alone, and perhaps it will be sufficient to say that I have succeeded two years, and then give the result of the two years' work. I had checks and I drew from the trees that were sprayed eight times as many pears as from the other trees. Putting it in the other way, the trees that were sprayed carried all the good pears; the trees that were not sprayed were attacked severely and did not give much fruit to speak of. The expense of spraying was not very much, compared with the returns, and it was a good return from the economical standpoint. One application was made of a rather thick whitewash, carrying from sixty to seventy-five pounds of lime to the hundred gallons of whitewash, and

that was applied just as the thrips were about to enter the blossom and, of course, before they had injured the blossoms. Some of the orchard was sprayed four days after the thrips had begun to work, and we saved what blossoms were left; we could not save the blossoms that had been killed in the four days. That just about tells the story.

MR. RUNYON. Does that lime spray kill the thrips?

MR. MORRIS. I can not say to what extent it kills them.

MR. RUNYON. Would you recommend using the lime spray in the beginning and then the tobacco spray afterwards?

MR. MORRIS. I would recommend using the lime spray in the beginning, and so far as our experience has gone, we have not needed the tobacco spray. Later some of the young thrips have worked and for those I would use tobacco.

MR. RUNYON. You do not know whether your spray kills.

MR. MORRIS. Where we use the carbolic there is no question about it.

MR. RUNYON. When you use the carbolic you injured some of the trees?

MR. MORRIS. Not at all. The trees are still standing.

MR. RUNYON. I understand some of the young trees were injured?

MR. MORRIS. The alkali would work against any injury, and all I can say is that I have not seen anything of it. I would leave that matter over. If it would injure any of the trees I would be sorry, but I have not yet seen such a thing, and I am not referring now to prunes; only to pears.

MR. SMYTH (of Napa). What nozzle do you use in spraying?

MR. MORRIS. I had no trouble at all. The secret of the whole thing is to get the lime properly slaked. Lime once properly slaked—and by the way, if you do not know how to slake it, I would advise you to get some mason who knows. Once it is properly slaked it is clean. That will go through at a hundred pounds to the square inch. I do not advise that, but it will go through; I have demonstrated that fact. The nozzle that I have found successful in this work is the one that throws, not the pancake, but the scatter. They are nominal in cost; you can probably drill them out slightly more than for handling other sprays, and if one wears out after a certain length of time, at a nominal cost another one can be put back. The Bordeaux nozzle is rather expensive; probably would not be advisable in this case.

MR. CUNDIFF (of Riverside). I want to ask Mr. Merrill if his recommendations apply to citrus fruits?

MR. MERRILL. Yes. We kill the thrips of the citrus with a contact spray. I do not know the exact formula for that, but I do know they use the black leaf for the citrus fruits; whether they use the Bordeaux nozzle or not, I do not know.

MR. CUNDIFF. What I was aiming at mainly was as to the time for applying the remedy. I believe the recommendation for the remedy is about the same as recommended by Mr. Borland, who made quite a line of investigations in Porterville district, but the time of application varies a little, of course.

MR. MERRILL. The citrus thrips is a different proposition entirely, because it has three or four generations in the year, and I presume they spray more than once; it depends on the condition of the fruit.

MR. CUNDIFF. One other question, while I am on my feet: One gentleman said something about experiments in burning sulphur, and I would like to ask the gentleman how that is done, how the prunes are confined, under a tent or if it is done in the open?

MR. CRAIG. I will answer the gentleman that he does not burn it under a tent; he simply used it in the middle of the four rows of the trees. He got up about two o'clock in the morning and worked until five. He did that about three times, taking note of the burning. To satisfy himself at the time that the sulphur did not damage the foliage, he had an old almond tree that he did not care whether he killed or not, and under that tree he told me that he burned over ten pounds of sulphur which did not affect the foliage.

MR. CUNDIFF. I think it would be impossible to affect the foliage.

MR. CRAIG. It seemed to affect the tender leaves of the almond tree just out, but they came out again all right—new leaves.

MR. CUNDIFF. I was especially interested in that matter because I was asked that question a short time ago—somebody who had heard of your experiments.

MR. CRAIG. Not mine, Mr. Atkinson's.

MR. CUNDIFF. Somebody asked me if I knew anything about the use of sulphur fumes.

MR. CRAIG. The results were excellent, whether it was the sulphur or not. There was the fact.

MR. ANDERSON (of Contra Costa County). We feel that we are the pioneers in this, because the first successful work was done in that county and in my orchards and in a neighbor's orchard, and we know something about the devastations, trials and tribulations of the grower who has to fight the thrips. We fought him unsuccessfully for years, and out of desperation I went to the State College and they said nothing could be done. I went to the State Commission and asked their assistance, and through them we got the department interested and an experimental station was planted at Walnut Creek, Contra Costa County, and Mr. Johnson and Mr. Foster, who were the right men in the right place, with the hearty coöperation and assistance of the growers there, worked out the black leaf formulæ successfully. Five years in succession I had a pear orchard that did not produce five tons of pears in five years. That orchard has produced a heavy crop for the last two years. Success is the only thing that counts in this world, and no formula for spraying is worth anything unless you can get the result. Now, I do not claim anything for myself, because I told the State Board that I had spent about the last dollar I had, that I would have to go out of the fruit business if I did not find some remedy for the thrips, and that my neighbors were many of them in the same fix. The last season we produced the largest crop of pears ever produced in that county. The year before that we had a record-breaking crop, but this year gives us better results. The best success has been made by a high pressure. A 175-pound pressure is not sufficient to give the best results. We use from 200 to 225, never letting the pressure get lower than 200. It is a driving spray, and you can get the spray into a partially closed bud. This I will illustrate by a little circumstance there. Mr. Foster came to me and told me that some of the farmers were getting discouraged and were going to quit spraying, and wished I would talk to them and see if I could not keep them at it.

I started over and met one of the largest growers in that county and took him in my office. By the way, I am riding an auto since I found out this remedy for the thrips. I met another grower, and they both agreed that there was no use to spray for the thrips. They said they could not do anything, that thrips were inside of the partially closed bud and could not be reached. I knew that they were mistaken. One of them said that he had been fool enough to spend what money he had left in spraying, but he was going to stop. I said, "You go out and look in your orchard and see if you can have any success." So he went out and behind his machine we could find only a partial success, very little encouragement; but we went into the orchard where they had sprayed the day before, and in those buds into which he said he could not get the spray, we found eighty to ninety-five per cent of the thrips dead, and we were using 225 pounds pressure. He harvested the largest harvest that was ever harvested on that ranch this year. Last year the crop was very fine, but not quite so good as this year. I know that the work has to be done thoroughly and promptly; but you can control the thrips and not exterminate them; and if the growers of this State will stand together and work together, it will make the work easier. I think it can be controlled easier perhaps on the prunes and the cherries than on the pears, but you can control the thrips if you go at it right. Mr. Swett here had the same experience, and I think he will bear me out. Some other growers in that county are present, and I think they will bear me out in the statement I have made. The thrips were fully as bad in that county this year as in former years, and every orchard that I know of in that county that was not sprayed had no pears of any commercial value or quantity. In Mr. Swett's neighborhood I think every one of those orchards was almost a total failure, so it was not a haphazard matter.

THE CHAIRMAN. Will you guarantee if we all work together that we will all have automobiles?

MR. CUNDIFF. I would like to ask the gentleman one question, and that is as to the number of times he sprayed and the formula he used.

MR. ANDERSON. I will tell you, you will have to mix a whole lot of common sense with this spraying business. I will tell you, the fellow that rides around in his automobile when he ought to be spraying will be afoot next year; and this spraying business requires a man to be right on the job all the time, and you have got to use a lot of common sense and judgment in this thing. I have watched the trees, and I do not know that I follow the same plan that some of my neighbors do, but I watched the weeds and I watched the trees, and I put off the spraying just as long as I think it is possible and get the work done thoroughly. The later you can spray, of course, the more thrips there are on the tree. The thrips will begin to show and they can crawl over a period of ten to twelve or fourteen or fifteen days. Now, if you can put off the spraying until the last thrips is on the tree and you do it well, you have got them all. Some of my neighbors who spray early have to spray twice or three times, but my experience is that it does not cost as much money as the gentleman says. I can spray my orchard thoroughly and efficiently twice for five dollars an acre; that includes everything. I use the Government formula, and that formula was worked out there in our orchard at that time. I will tell you, you have got to use a whole lot of common sense in this business and you can not learn the game in a year alto-

gether; you have got to follow it up closely, and you will know more about it next year and the following years.

MR. CUNDIFF. You have brought out just the point I was trying to get at; that is, you have got to use your judgment as to the time to use your spray.

MR. ANDERSON. And in mixing your spray, too. You can not trust that to a Jap, and you can not trust a Jap to put it on either.

THE CHAIRMAN. We have occupied an hour on this subject, and we have three for the afternoon. Is it your pleasure to continue this discussion? We will wait just a moment.

MR. SWETT (county commissioner of Contra Costa County). Mr. Anderson has covered the subject quite thoroughly. I can think of two little points I might add. In our campaign against thrips we find that the pruning of the trees cuts some figure. There have been a great many old orchards in the county that are full of coarse limbs or limbs crowded together. It is very difficult to spray so as to force the spray into the bud clusters in the tops of those trees, and in the centers particularly, so that in many orchards they are gradually cutting out some of the limbs. When that is done the man can thoroughly drive the spray into most of the buds that face toward the center of the tree. That is quite an important point, too. Another point is: It is a matter of rather delicate judgment to decide the day that you ought to begin spraying. Now, in one of my neighbor's orchards that I kept track of this year—perhaps everybody in the neighborhood was a sort of a committee, you know we do not know just when it will pay to begin spraying—the bunches begin to pop open very quickly, and the same weather brings the thrips out of the ground; it is a simultaneous proposition. The difference between spraying on Saturday or on Monday does not seem very big, but I have seen it make a difference of between fifty and sixty dollars an acre. You are between the devil and the deep sea. The thrips in forty-six or ninety-eight hours can do a good deal of damaging work. In the matter of pressure I can bear out Mr. Anderson. The higher pressure we can use the better the result seems to be on the whole. The people who try to spray with hand power usually lose a considerable percentage of their crop. It does some good, but it does not produce a maximum crop. The cumulative effect is perhaps just beginning to show up in our own orchards. There is one section that three years ago we could not spray because it was too wet; it would not hold up the power outfit, and the remedy in that particular block was very difficult, and we see the difference between that block and the others that were sprayed that year. I believe if a man has a prune or pear orchard, if he does good work and uses the third spraying to kill off the larvæ, he will have less and less thrips. We feel very grateful to the Government people who came there and worked out this method of control. This meant hundreds of thousands of dollars to our county. Of course we are interested. We had to buy tobacco or nicotine at \$1.25. If there were a cheaper way we want to know it. I think there will be some experiments made with the lime spray; but as far as the Government formulæ being effective, every orchard will back it. At an expense not to exceed \$15 an acre you can produce crops that ought to be worth from one hundred to three hundred dollars.

MR. BREMNER. Mr. Reed of Yolo County has a central power out-

fit that is, I think, going a long way towards solving the spraying question. I saw him spray three thousand trees in ten hours. He is going to give you a paper on the pear orchard.

THE CHAIRMAN. With your permission we will go to the next subject, if there is no further discussion. The next topic is "The California Fruit Exchange," by Mr. B. A. Woodford of Los Angeles. Mr. Woodford could not come, but he has sent the paper and probably nobody in the world is able to give so good a paper. We are glad to have this paper read by Mr. Essig on "The California Fruit Exchange," perhaps the best marketing institution that has ever been known in the agricultural world, and the best coöperative institution that the world has ever seen in the matter of agriculture.

THE CALIFORNIA FRUIT GROWERS' EXCHANGE AND ITS RELATION TO THE CITRUS FRUIT INDUSTRY.

The organization of the California Fruit Growers' Exchange nearly twenty years ago by the citrus fruit growers was due wholly to the failure of the speculative shippers (who had sole charge of the packing and marketing business up to that time) to return to the growers a living price for their fruits. In the early days of the industry, when the output was small, there was no difficulty in getting enough money for California oranges under the old methods to satisfy the growers, and at the same time to give the shippers a very large remuneration for their services. When the output began to increase rapidly, making necessary the development of new markets of consumption and an even and continuous distribution to successfully sell the crop, the citrus fruit growers immediately found themselves involved in difficulties. It became evident that if they were to be successful, and if the industry was to grow, the cost of packing and selling would have to be reduced to a minimum, and that new customers must be found in new markets, so that all the people in this country and Canada might have the opportunity to become consumers of these fruits all the time at reasonable prices.

The growers wisely determined at the beginning of the organized coöperative movement that they would themselves control both the packing and selling of their fruit with no profit from the operations at the California end of the line to any one but themselves. In attempting to establish their coöperative organizations on this basis great difficulties were necessarily encountered at the start. The growers were new to the packing and selling business, and naturally made many mistakes, while the speculative shippers, who had previously handled all the crop, had an advantage in the experience they had acquired during many years. As a result the volume of fruit marketed through the Exchange steadily declined during the first few years of its history, until at one time about 20 per cent of the crop was sold through the growers' organization.

Profiting by the experience acquired, and avoiding a repetition of the mistakes made in those early years, the results obtained through the Exchange gradually improved, so that seven years ago some 40 per cent of the citrus fruit crop was sold through it, and at the present time its business has increased to about 60 per cent of the total California output.

The Exchange organization to-day has by far the most efficient and best equipped packing and selling force engaged in the fruit business in

California, or, in fact, anywhere else, and this is proved by the increasing confidence the growers show in operating through it. A brief review or comparison of conditions as they existed just prior to the formation of the Exchange, and as they exist to-day, is interesting.

Then, the cost of packing a box of oranges and putting it upon the car was between 40 and 50 cents. Now, the same service, better done, costs on the average 30 cents.

Then, the growers paid the California shipper 7 to 10 per cent on the gross proceeds for selling the fruit. Now, a better service is open to all growers for less than 3 per cent.

Then, the freight and refrigeration charge on a box of oranges averaged for the season \$1. Now, the same service costs 90 cents.

Then, there was a customs duty on imported citrus fruits of less than 20 cents per box. Now, this duty is 65 cents per box on oranges and \$1 on lemons.

Then, California oranges and lemons were sold in a few large markets to a very limited number of customers. Now, more than 1,500 different jobbers in more than 600 different cities are assisting in distributing the 50,000 carloads that are annually produced.

Then, no systematic campaign of advertising or distribution was attempted. Now, a great sum is expended each year in placing the merits of California citrus fruits before the consumers, and the distribution is even and continuous at all times.

The net result of these changed conditions, reduced to a money basis, shows that the savings that have been made amount in themselves to much more than the growers now receive as interest on their investment, which demonstrates conclusively that without these savings through improved conditions, brought about by coöperation, the citrus fruit business would be disastrously unprofitable. It might be well to consider separately the different steps that the growers have taken in improving their condition.

In doing their own packing at actual cost, and themselves being vitally interested in the success of the business, they have, at the suggestion of the Department of Agriculture at Washington, adopted careful methods of handling the fruit which have almost wholly eliminated loss from decay. They have also improved the appearance and character of their grade and pack, making both more uniformly good and dependable. By handling a large volume of business in each packing-house, they have removed that unbusinesslike feature which formerly existed in unnecessary packing facilities, when each large speculative firm felt compelled to have a house at each important shipping point—many more than were required for handling the business, all maintained at great expense, for which the growers in the end had to pay. By buying supplies in large quantity they are treated by the manufacturers as wholesalers. The result of all these things is a better and more attractive product and a great saving in packing costs.

In selling, the growers early adopted the wise policy of establishing their own offices in the principal centers of distribution, with their own salaried men in charge. These salaried agents, as distinguished from brokers who sell all kinds of produce, are working all the time exclusively to extend the market for California oranges and lemons, and this fact, in connection with advertising, is largely responsible for the wide distribution and successful marketing of the present great output.

In advertising, more than in any other one thing, great benefit has come to the industry. During the season advertisements are carried in the daily papers of practically all the consuming markets, calling attention to the fact that California oranges and lemons are good to eat and that they can be had at reasonable prices. Experience shows that consumption can be at least doubled in any section by judicious and extensive advertising. The Exchange is now expending nearly \$200,000 per year for this purpose, and is getting highly satisfactory results, yet its shipments are so great that even this large sum only means slightly more than a penny per box on a year's output.

The growers have met the greatest difficulty in reducing freight and refrigeration charges to a reasonable basis, and have only been partially successful. Freights are now about 10 per cent lower than formerly, but still further considerable reductions will come before long.

In customs duty matters an industry, 2,500 miles from the principal markets, employing the highest priced agricultural labor in the world, and handicapped with the risks attendant to the growing and shipping of a perishable article, can only exist with a duty imposed upon competing imported products that will in a manner equalize the difference in these varied costs between home and foreign production. Oranges and lemons have very nearly been accorded such protection under existing laws and whether considered from a protective standpoint, or from a revenue standpoint, these duties are warranted. They have only been attained through the united action of the growers themselves, and can not be maintained without vigilance on the part of all interested. This feature of the business, as well as freight rate matters, is well cared for by the Citrus Protective League, an organization composed of all Exchange growers and about one half of those not in the Exchange.

To sum up in a few words the accomplishments of the growers through coöperation in the Exchange: packing and selling costs have been reduced one third; transportation charges have been reduced 10 per cent; customs duties on imported competitive fruits have been put on a fair basis; so that with advertising and distribution intelligently applied in a large way, a crop of 50,000 carloads annually is now successfully marketed as compared with the disastrous results obtained twenty years ago under the old methods, with a crop of only 4,000 cars, and the consumers get better fruit at a lower price than ever before.

The California Fruit Growers' Exchange buys no fruit, and in fact actually sells none. It maintains at the highest state of efficiency possible a complete marketing medium through which its members conduct, each for himself, their selling operations. It is gathering market information in all markets every day in the year, which it immediately transmits to all shippers operating through it. The results of each day's business transactions in all markets are given all Exchange shippers daily in bulletin form, so that each is fully informed and can intelligently handle his own business of picking, packing, distribution and sale. In addition to this, the Exchange is instrumental in furnishing, to the daily press in California, complete and accurate information of citrus fruit sales in Eastern auction markets, in this manner placing before all growers the actual condition in those markets.

Coöperation can be extended by the fruit growers to other lines and some successes have already been recorded in that direction; notably in

the purchase of orchard supplies, such as fertilizers and materials for fumigation. So important is this matter of supplies, that the Exchange growers have seen fit to form a supply company, with a capital of one million dollars, the attention of which is all the time directed to the best and cheapest way in which to obtain all materials of common use in the packing-house and orchard. The investment which the Exchange growers have made to date in packing-houses and in their supply company, which they own in common, as distinguished from the individual ownership of their orchards, amounts to more than three million dollars.

With the notable increase in crops as the years pass along, the necessity for coöperation becomes more and more apparent, and without it every item of expense would rapidly increase and the whole industry would soon be involved in disaster. All difficulties have not disappeared by any means, and there are at all times those interests which seek to break down the growers' organization for their own individual gain. In the Year Book of the Department of Agriculture for the year 1910, there appears, in an article on coöperation in handling and marketing fruit, the following paragraph, which, referring to the California Fruit Growers' Exchange, aptly illustrates the situation:

"Fewer serious efforts are made now to break down the coöperative principle among the growers. New schemes of fruit marketing are proposed from time to time, the organizations are frequently attacked in the courts under one guise or another, and other insidious movements are started, all having in view the possible splitting open of the coöperative organizations and a return to the methods of marketing which would destroy the systematic distribution and marketing now in operation and reinstate the chaotic speculative methods that were formerly in vogue. The coöperative movement in the citrus industry is the result of a slow, painful evolution, and the grower does not appear to be deceived by these efforts, no matter how ingeniously and artfully they are conceived."

In conclusion, a successful future for the citrus fruit business in California is assured for many years to come, provided only—

First—That the growers continue to coöperate in the handling of these great problems, common to all.

Second—That they raise good crops of fruit of good quality.

Third—That the financial condition of the people of the United States and Canada continues to be such as will permit them to make fruits, as well as the actual necessities of life, a daily article of food.

B. A. WOODFORD.

NOTE.—In the Year Book of the Department of Agriculture for 1910, on pages 403-405 inclusive, is a very comprehensive article on "The Organization of the Citrus Fruit Industry in California." That article gives a detailed outline of the coöperative efforts of the citrus fruit growers, and all interested are referred to it for a full description of the operations of the California Fruit Growers' Exchange.

THE CHAIRMAN. Now, ladies and gentlemen, this is before you for discussion. This is one of the most important topics you will have to discuss, and I hope it will be thoroughly considered. I heard Mr. Woodford say not long ago that when ninety million dollars' worth of fruit has been sold through the Exchange, the total losses were less than five hundred dollars. If there is an example of better business management than that on record, I would like to hear of it. If there is nobody else to speak I am going to say a little more.

Two years ago they decided on this matter of advertising and the first year, I think it was, they, the executive committee, voted \$25,000—and there was a great furore—they must not do that; everybody seemed to think they had to pay that \$25,000; they had to pay hardly one mill to the box; they had a very good year. The next year they put it up to \$50,000; there was some complaint; but that year was better than the year before; the next year they doubled it; and there was much less complaint. This year they have put it up to \$200,000, and everybody says it is the thing to do. I hope you will have something more to say about this. You have a deciduous fruit exchange up north. This is too good a thing to pass without a thorough discussion.

MR. BOWMAN (of Bowman). With regard to deciduous fruit, wouldn't it be well to leave that until the deciduous fruit is brought up? There is a movement for a protective league for our northern counties, and I think it might possibly be well to leave the discussion until that comes up.

THE CHAIRMAN. Perhaps so. If there is nothing further, then we will pass to the next topic. Here we have, and I wish we had more—a lady to discuss a question. Mrs. L. Barlow of Sebastopol. [Applause.]

BERRY CULTURE.

MRS. BARLOW. *Mr. Chairman, Ladies and Gentlemen:* It is with pleasure I will try and say a few words on the growing of berries in our Gold Ridge section. This is in the foothill region of western Sonoma adjacent to Sebastopol.

About forty years ago the first blackberries were grown by the late W. J. Hunt, and it was soon proved that the sandy loam soil, together with the moist cool summers, fanned by the coast breeze, and an abundance of winter rains, made it a favorable locality for berry raising.

Our principal varieties grown are the Lawton blackberry, Red raspberry, Mammoth blackberry and the Loganberry; of which the Lawton blackberry is most extensively grown, and more than doubles all other varieties. Its adaptibility has been proved by the test of time. There are some of the oldest vines still standing and bearing well with no pest of any kind to molest them.

Planting.

In planting the Lawtons the plants are obtained by digging the shoots that sprout up late in the summer between the hills. These plants are dug with a good cross root from three to four inches long. This is a point which should be looked after very carefully, so as to insure a fine strong growth when planted. These are upright growers and are planted eight feet apart each way. With one-year-old vines one stake is used, and two the second year. These are six feet in length and are driven one on each side of the vine close in but spreading at the top, to allow for lateral growth, and ease in picking.

Pruning.

The pruning does not amount to much the first year, but in the spring of the second year the tender shoots that are thrown out are only allowed to grow about four and one half feet high. Then the top is clipped off, which causes them to throw out laterals, and these are cut back to the

length of from six to eight inches, and hold the berries for the coming year. The old wood is taken out each fall, and the new canes "after being pruned" are tied firmly to the stakes, and are ready for the spring cultivation to commence. Our raspberries are grown closer about six feet apart each way, and only one stake is used. The only pruning required is the topping back in the spring and taking out the old wood in the fall.

The Mammoth blackberry and the Loganberry have met with much favor in our locality, coming in very early in the season, and are off before our Lawtons ripen. Their adaptability to our soil and climate has given them a wide planting, and their vigorous growth and prolific bearing has made them favorites among our growers.

The Mammoth blackberry is in full fruiting at the time the Logans begin to grow light and the Lawtons are beginning to ripen, thus giving us a continuous succession of Logan, Mammoth and Lawton for a season of about three months. The Logan and Mammoth are running vines and must be trellised. This is done in the winter, two wires being used one above the other, about two and one half and three and one half feet above the ground.

The plants from these varieties are grown from "tips," which means putting a trowel full of soil on the tip of the new growth after the first rain in the fall, causing it to take root, and by spring these are ready for planting.

Cultivation.

Thorough cultivation is very necessary in the raising of fine berries. The ground should be plowed four times, that is away from the vines both ways, then back again (after the hoeing has been well done) with a thorough harrowing after each plowing, as we do no irrigating, this leaves our ground light and mellow, and is able to hold the moisture during the long warm summer days.

I would like to mention here that we value our heavy cover growth (that is on the ground at the time of our first plowing) very highly. This is from three to four inches high by the first of March, when it is turned under.

Harvesting.

The vines in the springtime rapidly take on beauty and are one coat of white for several weeks. This reminds us that our harvesting season is soon to come, and we must be up and doing, if we would be ready for that busy time and everything is made ready.

Some one may ask where is all of the help coming from? Our work in the fields is done by our neighbor boys, who have grown with the berries from year to year and thoroughly understand caring for them. Then, at picking time, the "Boys' and Girls' Aid Society" come up from San Francisco. This consists of their superintendent and officers with from one hundred to one hundred and fifty boys, all equipped for their summer outing. These are established on a good, comfortable camp ground for the season of from three to four months.

Young ladies are engaged to assist in receiving and inspecting the berries as the boys bring them in from the field, and every possible care is taken in picking and packing.

Marketing.

Our shipping packages are a light crate, which are sold through "The Sebastopol Berry Growers, Inc.," to Eastern points, with some distributed in the northern towns of our State.

I would like to say, before I close, our berry association has been of great benefit in the marketing of our berries. It has caused number one fruit to be put on the market, has opened up good Eastern markets, and relieved our home supply, so the canneries are able to pay us good prices, and are always hungry for more. I thank you. [Applause.]

THE CHAIRMAN. Now, this question, although it has been so ably presented, is before you, and I am sure you will want to ask many questions.

MR. TREBBLE (of Sacramento County). The lady did not mention the variety of raspberries she grew.

MRS. BARLOW. The red raspberry mostly.

MR. BOWMAN. I would like to ask if they have a second crop.

MRS. BARLOW. When our berries commence to bear they have a continuous crop until they are all gone.

MR. BOWMAN. Just the one crop?

MRS. BARLOW. Just the one crop.

MR. BOWMAN. That is the one year's cane?

MRS. BARLOW. The old cane is taken out and we only have the crop on the one cane.

MR. BOWMAN. In Placer County we have two crops, and the second crop is more valuable than the first. The second crop comes in the late fall. I was wondering if they were doing that in the other parts of the State.

MR. ROEDING. I would like to ask if they use the Phenomenal berry to any extent?

MRS. BARLOW. Well, we have grown the Phenomenal berry some, but not anything like the Loganberry.

THE CHAIRMAN. How do you find it, Mr. Roeding?

MR. ROEDING. I have never grown the Phenomenal berry very extensively in Fresno, but it is grown in Santa Cruz County. They inform me that the Phenomenal berry is far superior to the Loganberry, a stronger grower, larger and better flavored. Personally, I have always had my doubt as to whether or not the Phenomenal and the Loganberry were identical. Mr. Burbank claims they are not, and since talking with growers in Santa Cruz County and knowing the emphatic statements they make, I am inclined to think, although there is quite a similarity, that they are distinct, and I thought I would like to hear Mrs. Barlow, knowing she is to a great extent engaged in the berry business, and ascertain whether or not the Phenomenal berry in this district has been found to be superior to the Loganberry.

MR. NEWCOMB (of Sebastopol). There is a slight difference between the Logan and the Phenomenal, but we find that most of the difference is that the Phenomenal is about a week later than the Loganberry, and most of the growers prefer the Logan to the Phenomenal on that account. The Phenomenal is a little larger, but at the same time most of us are sticking to the Loganberry. The one week earlier is a good help to us. That is how we get the good price.

MR. HICKMAN (of Monterey). The Phenomenal berry is much firmer and brighter than the Loganberry with us. If we hang them on the line until they become dull they are a delicious berry for all household purposes. I have not tried them to any extent because I have been engaged in other matters.

MR. TREBBLE. I would like to ask about the Himalaya berries. We people over in central California or in the interior valleys, as we call that section, understand that there was not anything else grown than the Himalaya. We grow these berries, and we always thought that it was the Himalaya that was grown here.

THE CHAIRMAN. Mrs. Barlow, what about the Himalaya?

MRS. BARLOW. The last few years there have been quite a few of the Himalayas planted, but as Mr. Newcomb says they are a late berry, and they are not paying so well, I think.

MR. KELLOGG. Mr. Hickman gives just the reverse of what is true in Shasta County. The Loganberry there is a firmer berry than the Phenomenal. The difference in location I suppose accounts for this.

MR. HICKMAN. I want to say a word in regard to the Himalaya. The Himalaya has a much longer period than any other berry I know of—with us. The true Himalaya grows rampantly as a climber.

MR. RUTHERFORD (of Modesto). A number of years ago I bought some berry plants from Santa Rosa, supposed to be the Phenomenal, and also I got some from Santa Cruz, supposed to be the Logan, and I planted them near together, and I defy any man to tell one from the other.

MR. REARDON. I think Mr. Rutherford ought to tell what nurseryman he bought the berry plants of.

THE CHAIRMAN. Shall we continue this discussion? This exhausts our program for the afternoon. There is a gentleman here from Campbell, Mr. Craig, that has a proposition that I think is suggested by the remarks of the lady in regard to the help she employed, as it involves the boys and girls, and I always think a big lot of the boys and girls. I will be glad to have him occupy a few minutes.

MR. CRAIG. *Mr. Chairman, Ladies and Gentlemen:* I want to say, Mr. Chairman, that I had a set of resolutions that I did not bring up that I would like to present.

In Santa Clara County, ladies and gentlemen, we have found that the labor question, as you have found, I suppose, in all parts of California, is a live question. I do not think that there is anything in this business we are engaged in, of fruit raising, that comes nearer to our pocket-books than that of adequate and proper labor at the proper time.

It is truly next to the raising of good crops and of fair prices, for it makes no difference how heavy our crops are—I mean our perishable crops—if we can not harvest them at the proper time, bankruptcy will stare us in the face.

I have found in my experience in a little prune orchard that mothers and their children are ideal help. For a while I tried young people, and it was a most successful failure—that is, young people without their parents. I found that the boy would play ball with the prunes and lay around in the shade. I did not get discouraged and did not appeal to the Oriental, for I believe this is a white man's country, and we should help the white man and the white woman. [Applause.]

I went to the city of San Jose and visited some mechanics and told them what I wanted. I found one gentleman who said: "I think my wife and my children and my sister-in-law's children who are visiting us, perhaps, would all gather prunes." I got them to come, furnished them with tents to sleep in, furnished a cheap wire mattress and a little sheet-iron stove. They brought their own cooking utensils, their own blankets and that sort of thing. The grocer and butcher passed by two or three times a week, so that they could buy those things, and I want to tell you that I could not find better help than that.

There is a great stumbling block to this white labor, and that is that under the present law of California, if the children of California are of school age, we can not utilize them; the parents can keep them out of school only during the vacation period. It comes too early, and if we want to make a success of this white family movement—and I was delighted to hear this lady (Mrs. Laura E. Barlow) tell of the work of those little children of San Francisco—we must insist upon the school boards making the vacation period correspond to the ripening period. That is not the same in all parts of the State. If the vacations are made to correspond with the ripening period you will get all the help you want, but we must appeal to the school and college boards to fix the vacation period to fit the ripening period.

There is to-day sent out of the State of California two million dollars for help, help that the women and children can do about fruit canneries and orchards. They can gather and cut the fruit, and I tell you they are poor—many of them; they have a struggle to keep the wolf from the door. They belong to the same race that you and I, and all of us do. It is our duty to help them; it is our duty to do that rather than pay out our millions to an unassimilated people.

Let me appeal to you as you go back to your homes to demand of the college and school boards in your district that they make the vacation period fit the ripening period, and then you will get all the good white help you want. Right in San Francisco and Oakland there are tens of thousands of women and children—poor and honest and earnest—who never get into God's sunshine in the country. This employing them to gather our fruit and work in the canneries will give them an opportunity to bask in the sunshine and at the same time do our work.

I want to present these resolutions to-morrow, and I sincerely hope this body will endorse them so that in the years to come we will have all the good and adequate help we want. [Applause.]

THE CHAIRMAN. I will say that Mr. Beers is the chairman of our Committee on Resolutions, and any resolution you may have, please hand it to him. Their committee will consider that, and if any of you want any resolutions or subjects presented, please mention it to Mr. Beers. Now, this question is before you. Does any one wish to speak further on this subject?

MR. BISHOP. My county is noted particularly for the production of walnuts, a celebrated crop of that section. It is an old Spanish section and largely peopled by the Spanish, and they make this arrangement: Our walnuts ripen in October, and we are liable to have rain, because we do not want it at that time, and they open their schools three weeks earlier in that section—just one district; and then they take a three weeks' or one month's vacation at the time of gathering walnuts so that

Mexican children have the opportunity of earning a few pennies, and the people are getting their walnuts gathered, and that is done every year by mutual consent.

MR. HICKMAN (of Monterey). In northern Monterey County we have a fruit-growing section just adjoining the San Luis Obispo County line. Of course, San Luis Obispo County has much the same industry as in that section. The Loganberry comes first there, and the children who are out of school begin on those. Then the growers there combine and find out what they need in the way of help, and advertise, and as the Loganberry crops ripen their help arrives. Wood is supplied them and water and such things, and the butcher and the baker and the grocer come there. As the crop begins to ripen more and more help is put on, until finally they have one hundred families and probably six hundred individuals, mothers and fathers and whole families, and some come 110 miles. They come year after year. This year there was a bumper crop, and they all found work for about seven or eight weeks. The school vacation is adjusted to meet this condition, of course.

THE CHAIRMAN. Anything further? We have something over half an hour yet before we need to adjourn, and if there is any other topic that anybody would like to present there is a good opportunity. I know often when I read a program of a meeting I wish that a certain subject could have been discussed, and very likely some of you, when you read this program, thought that some topic should be brought up. Is there anybody here that thinks some other topic should be considered?

MR. McBRIDE (commissioner of Solano County). Regarding the labor question: I have often wondered if the people from the old country are flocking to the other parts of the State as they are to Solano County. I could not say the parts from which these Spaniards come, but there are a great many classes; some of them are more highly civilized than others, but they are coming. Three or four years ago the men began to come over, and this last year they brought their wives and families, and it seems to me that it is changing the labor situation to a certain extent. Since their wives and families are coming over there, whole families are usually found at work, but the children do very little good. The older ones as a rule have to take care of the younger ones, who are not old enough to work. I wonder whether the Spanish are going to the other parts of the State as to Solano County.

MR. BISHOP. I did not know that they had an importation of those Mexicans so far north. The development of the beet field in Orange County brought in or gave employment to a great number of the Mexicans, and I want to say that we consider them at this time a very undesirable class of citizens. We have had a great deal of trouble with them. We have sent from our county within the last six months five Mexicans to San Quentin; and while we have a dry county and every town in the county, with the exception of one, is a prohibition town, yet they succeed in some way in getting liquor enough to make a considerable disturbance in centers where they are located on Saturdays and Sundays and holidays. They are very undesirable. The Spanish settlement I spoke about is one of the oldest settlements in the State, namely, the San Juan Capistrano Mission. They are all naturalized. They all speak English, and they are considered quite a desirable people, because they are quiet and have their own homes; but those that we are importing now are very

undesirable. They are the same as the Japanese and Chinese. We have them to thin the beets.

MR. BREMNER. Mr. McBride is speaking of the Spaniards from Spain and Mr. Bishop is speaking of the Mexicans, an entirely different people.

MR. TURNER. It seems to me we generally do not overlook the matter of presenting the proposition of the railroads and the labor question, but we overlook the most important one of all; that is, fertilization of our soil. I would like to hear a little discussion on that subject. When an orchard gets along in years it is mighty necessary to feed that soil, and I have no doubt that there are men here, who have had practical experience, that could give us some knowledge as to what to use in the line, possibly, of commercial fertilizer. I think it is a very important subject for discussion.

THE CHAIRMAN. *Ladies and Gentlemen:* I think the gentleman is very right, that this is one of the most important subjects, and I would like to suggest a point to the committee on resolutions. I think, perhaps. I am a little of a crank on this subject—that is, that it is one of the most important things to come before our people to be discussed—is this matter of soil. If I may give some of my own experience—two or three years ago I was in Washington and this matter was in my mind, and I thought it to be a very important one. I went to Dr. Galloway and I said to him, “We do not seem to know very much about our soils. We seem to be greatly in the dark. I find nobody in the part of the State in which I live who knows what he ought to do.” And I said, “Dr. Galloway, don’t you think it is one of the most important topics we have to deal with?” He said, “I believe it is.” And I said, “Don’t you believe if there was a really great man, who had studied the question—don’t you think he ought to bring out good results?—such a man as Dr. Powell—a line of work which he discussed and studied while here?” And he said, “You are right again.” I said, “Have you got such a man?” He said, “I have got such a man.” I felt pretty good and I said, “Will you go over with me to Secretary Wilson?” We went over to Secretary Wilson and the same conversation was gone through with, and at the end Secretary Wilson turned to Galloway and said, “Dr. Galloway, have you got a man?” Dr. Galloway said, “I have.” Secretary Wilson said, “Dr. Cook, if you go back to California and find out that you want such a man, and the Citrus League sends word to me, we will furnish him.” Things looked beautiful, and then some way or another the thing died down. And when Mr. Jeffery, my predecessor, at the meeting at Pomona, asked for action, a committee was appointed. Mr. Chapman was chairman, and the matter came up again; it looked as if we were going to get some results along this line, which had occurred to me as being so important; but nothing has been done yet. But I believe something is in the air, and I believe Dr. Powell is going to have something to do with it.

Mr. Chapman, who is one of the most successful growers in the State—you notice his prices are something tremendous, and he has got an automobile, by the way—Mr. Chapman says, “My orchards are producing tremendously, and,” he says, “when my horses work hard, they have got to have lots of feed, and I feed them liberally, and the same way with the soil, I put the fertilizer into the soil in great abundance; but I

do not know whether I am doing it right or not. I am using great quantities of fertilizers." Now, that, it seems to me, is suggestive. Again Mr. James Mills—some of you have met him up here—says there is only one thing he is dead sure of—he knows—and that is that we do not need any potash in our soil. Another man, Mr. Frank Palmer, one of our splendid growers, a man of fine intelligence and brains, says, "There is only one thing I am dead sure of, that I know, and that is, that we need potash in our soil." Isn't there something wrong about this? Ought we not to have some real information about this subject? It seems to me that one of the things we most need is some man that would go to the very bottom of the matter. I am glad that the gentleman suggested this. I think we can devote a good deal of time to this subject with a good deal of value to us. I am going to call on Mr. Roeding. He is a producer that gets results. Won't you lead this discussion about fertilizers in our orchards and nurseries?

MR. ROEDING. Mr. Chairman, I am rather surprised to be called on to make any remarks upon this subject, particularly to lead this discussion, because I am not aware that I am much of an expert in the matter of fertilization; in fact, I must confess that if there is any one subject that I feel exceedingly ignorant about it is the matter of fertilizing our orchards. I agree with my friend, Mr. Turner, that the fertilization of our orchards and vineyards is a problem that is of the greatest interest to all. There is no question in my mind but that there is only one way to determine how to get results, and that is by a man studying the conditions on his own ranch. California has such a diversity of climate, such a diversity of soil, that it is very difficult for any one in any particular locality to lay down any fixed rule as to how others should fertilize. I happen to have some places in the southern part of the State; and I have been very much impressed with the remarkable success which the growers there have obtained by the use of cover crops. So much have I been impressed with their success that I have been trying for the last three years to obtain similar results in my orchards in Fresno. I regret to say that thus far my experiments have been without very much result. You ask why that condition has arisen. I can only attribute it to one thing. It is not due to any particular efficiency in our soils of Fresno that we can not grow cover crops, but it is largely due to the fact that during the winter months, from the first of October on, we have more or less cold weather, in fact, much more cold weather than in Los Angeles; I venture to say that units of temperature in Fresno County as compared with Los Angeles would be many hundred degrees less. I am only venturing this; I have never looked into it carefully enough to make an accurate statement. But this year I planted earlier than usual. The ground was in beautiful condition, warm, and the cover crop should have come up, but it is only beginning to sprout now. The last month, in fact, from the fifteenth of November, we have had frost almost every morning, with the result that the crop is hardly out of the ground, and the consequence of this will be that by the time we can get ready to plow, the cover crop will not be large enough to do any good. If you visit the orchards in southern California you see the crops growing luxuriantly, just as if you were going through an alfalfa field. I think the commercial nurseries, where stable manure is wanting, in the interior valleys of the State and other sections where we have cold winters, have great necessity to attempt to find some crop that

will develop more quickly than these cover crops we have been using. In my experiments, if it is possible, I intend to plant my crops in August, instead of in October.

MR. HICKMAN. I do not know anything of nurseries, but I do know quite a bit about orchards. I know of one orchard that has been growing for thirty-eight years and that man depends entirely on the natural cover crop. He waits for it to get well grown and then turns it under. He has been bemoaning very much that last year, owing to the late rain, he could not get it under early enough.

THE CHAIRMAN. The meeting will stand adjourned.

EVENING SESSION—FIRST DAY.

Mr. Roy K. Bishop acted as chairman.

THE CHAIRMAN. Ladies and gentlemen, unfortunately we were unable to announce this afternoon that all the growers of fruits and nurserymen and others, as well as the County Commissioners, were not only welcome but invited to these evening sessions, which, while they are the sessions of the County Horticultural Commissioners' Association, are also a part of the State Fruit Growers' Convention, and we believe that the fruit growers and horticulturists in general will gain as much probably from what they would hear at this meeting as at others, and we know that the horticulturists and agriculturists as well can aid us in our meetings, and we would invite you to partake in the discussion as much as possible.

This seems to me to be probably the best meeting of horticultural commissioners that we have ever had in conjunction with the State Fruit Growers' Convention, notwithstanding that you have been meeting in a similar way for the past twenty years, and that the association has been recognized as an association for that length of time. I do not know that it is necessary for me at this time to make any long and extended speech. It is not required of me, and we might as well launch into our program, as it is pretty well filled, and our time is only limited. I think the first thing in order would be a roll call of the County Commissioners, and as the Secretary calls the roll, those who are present will please answer aye.

(The Secretary called the roll and announced thirty-four as present.)

THE CHAIRMAN. Thirty-four commissioners present out of an even forty.

The first paper upon the program this evening is one by Mr. H. P. Stabler of Yuba City, "The Law and the County Commissioner."

THE LAW AND THE COUNTY COMMISSIONER.

MR. STABLER. *Mr. President and Gentlemen of the Convention:* This subject of "The Law and the County Commissioner" is a very large subject. I have only tried to treat one phase of it, and I will say at the outset that the whole purport of my paper can be summed up in three words—enforce the law.

If the law is a good one, there is no reason for its non-enforcement. If it is a poor law, or ineffective, its enforcement will soon disclose its

weak features and it can be supplanted with better legislative enactment. A good law not enforced accomplishes nothing. As all county horticultural commissioners are now under bonds to properly perform their duties, what excuse can be given for not enforcing the law?

Strict enforcement of the horticultural quarantine laws of the State is better for the fruit grower, better for the nurseryman and better for the consumer. It is better for the grower because it simply requires him to eradicate the pests and diseases, which, if allowed to continue on their wayward course, would ultimately ruin his property. It is better for the nurseryman, because it requires him to sell clean stock, which saves him the expense of disinfection and rejection at the point of destination. It is better for the consumer because it makes it possible for him to buy clean fruit, which increases consumption.

If the foregoing is true, and I maintain that it is, why is there any question about the advisability of enforcing the law? In the first place, the lot of the county horticultural commissioner is a hard one. He not only has to fight the pests, but too often the grower and nurseryman whom he is trying to help. In too many instances we find growers careless, prejudiced and ignorant, while the consumer is indifferent, and we all realize the stubbornness of some nurserymen. Again, we find county commissioners who are peace-loving and believers in the doctrine of moral suasion, missionary work, and publicity. While these means of accomplishment are not to be entirely disregarded, they can not be depended on to eradicate pests and diseases. They are effective only when accompanied by a final enforcement of the law.

The writer tried moral suasion, missionary work, and demonstration in pear blight control, and with indifferent results. Pear blight appeared in the Sacramento Valley in 1904. Professor Pierce was notified, and sent directions for its control. This was published in the local papers and bulletins distributed among the pear and apple growers. Some work was done. The next year Professor Waite of Washington and Professor Smith of the University demonstrated, with their assistants, a successful means of pear blight eradication. We published their method as a bulletin, and it was widely distributed. One of Professor Smith's assistants was employed as an inspector, and demonstrated pear blight work to growers. Personal solicitation and entreaty followed. Some growers did the work properly and secured results. Others did it in a careless way, or neglected it, and the result is that we still have some pear blight in Sutter County. It is the intention of the commission to enforce the law in Sutter County this season. Remember, this work was carried on in an important pear- and apple-growing district.

Contrast the manner of handling the outbreak of the white fly in Marysville. In the spring of 1907 the *Aleyrodes citri* was discovered in Marysville, a city not in a citrus district, and in the dooryards of people who were not growing oranges commercially. Moral suasion was invoked and resulted in some denudation. Missionary work was tried, followed by more denudation. Even demonstration failed to convince the owners of orange trees of the importance of the work in hand. As a last resort, it was decided that the law should be strictly enforced. Legal notices were regularly served and more trees were treated, but still some owners persisted in their do-nothing policy. A suit was brought, and the commissioner was not only upheld, but the decision

of the court was so sweeping that every tree was immediately denuded of foliage. The result was that *A. citri* was absolutely controlled in Marysville. If there have been two or three suspicious cases since no one has objected to the enforcement of the law. How much better to follow this method than to worry along for several years under moral suasion, to find in the end that enough growers have been careless so that the pest or disease has been spread to other districts.

Other public officials do not depend on moral suasion and missionary work. Let me cite the county tax collector. What percentage of the public funds could he collect if he simply asked the taxpayer to, please, pay his taxes? He might say, "Mr. Jones, the county really needs the money, and I have been appointed by the people to attend to this matter. The law requires it, and I am under bonds to do my duty." Mr. Jones might reply, "I don't know whether I will pay my taxes or not. I hear so much about this every year that I am tired of it. I don't believe in taxes, any way." But the tax gatherer simply enforces the law. Mr. Jones expects nothing else, with the result that the delinquents are very few. Even they are provided for, and their taxes are paid and the State takes a lien on the property, all of which goes to prove that the county commissioner is justified in strictly enforcing the law. The grower will soon learn that there is nothing else to do but clean up, and he will do it, or it will be done for him, and he will pay for it. The nurseryman will learn that he can only ship clean stock, and he will do it. The consumer will learn that all fruit offered for sale is clean, and he will buy more of it.

Discretionary power is given the commissioner but not the grower. The time has passed when a fruit grower, nurseryman, or any one else can conduct his business in a manner injurious to others. When he deems it necessary, the commissioner can cause an inspection of orchard, nursery or other place to be made, and he can compel an attempt at least to be made to eradicate pests and diseases. Why not do it? [Applause.]

MR. CHAIRMAN. Mr. Morris not being present, I will ask Mr. Volck, the commissioner of Santa Cruz County, to open the discussion upon this subject.

MR. VOLCK. *Ladies and Gentlemen:* I think that Mr. Stabler has hit the nail on the head with exceptional vigor when he insists on the enforcement of the law, and I do not know that I have anything to add to his arguments. It seems to be very clear in every respect. At the latter portion of his paper he touched upon the fact that the commissioners have discretionary power. Now, in this power to discern what may be a very serious pest, and what is only something of more or less danger, and perhaps of no danger, but merely a rather objectionable thing to have around, and in some respects a nuisance, the commissioner under the law has this discretionary power of, in a way, neglecting that particular thing and devoting more of his time to the really important question.

How far this discretionary part of the law is going to work out for the good of the fruit industry is a question which I believe is worthy of some discussion and some study. It certainly will save the county considerable expense if the commissioners, being well informed, choose only the lines of work which are really necessary and essential, and avoid

useless expenditures of money for things which will not result in great financial gain or are not really necessary.

Now, my place is merely to open the discussion, and I would like to hear from other state commissioners just what their idea is regarding the discretionary powers of the county commissioners.

THE CHAIRMAN. Is there any further discussion? Is there not some fruit grower that can discuss this proposition that has been laid down by the two gentlemen who have just spoken, some one who says that "Well, I know that I have got these things, and that they are a detriment to me, but I have not got the money to clean up?"

MR. BOWMAN. I feel the way Mr. Volck does on this subject: We have arbitrary power to a certain extent. The law reads, that whenever we deem it necessary we may call an assessment to be made. In regard to San Jose scale, I suppose you can go into every orchard and find a sample, but it is entirely controlled. We have no case except two or three, and it would really be unnecessary for us to enforce the law against San Jose scale; whereas, in some counties perhaps it would be very necessary. It caused us a great deal of expense, and I feel that is just one of the points where we could use some discretion. That is merely an instance; there are others.

MR. WEEKS. My experience is that in working the horticultural law the commissioners want to start something against us; for instance, you go into a large orchard and suppose there was some Johnson grass growing on this property, and you get your notice that this nuisance shall be abated. The grower says, "I have tried to, and I can't do anything with it." If you have a thousand acres of vineyard that is badly infested with Johnson grass, the law does not say that the people shall completely rid the property from this Johnson grass, but you are ordered to prevent its going to seed. That would be rather more than a person could handle in lots of cases where help was scarce. Supposing you have issued these orders to have this nuisance abated and they want to fight this case and they say, "Go ahead and abate the nuisance," and there is a shortage of help; maybe it is in a position where it would cost a great many dollars an acre to prevent its going to seed. In a case like that, the commissioner might better use his discretion to leave the thing alone. If it is found infested with any diseases or insect pests, the commissioner might send it immediately out of the county or fumigate it, and use his own judgment. There are some things that the law provides the commissioners should do. And, speaking of the discretion of the county commissioner, I think it would pay a little to look into this matter before he starts anything like that. In my county last year there was a creek bottom, very rich land, where on the upper part of it, it was infested with Johnson grass. One orchard just below this infested spot was absolutely clear. The owner of the property came to me—he had sprayed the property—and he said, "I don't want any Johnson grass on my property, and I want you to see that that does not go to seed." I filled out the notice and served it on this owner. He paid no attention to the notice. I went in and had the grass removed and kept it from going to seed. I made it a rather expensive proposition. When I mailed him the bill he paid no attention to it. I took the matter up with the district attorney and the thing went to within a month of going to suit. He paid the thing under protest. He said, the Johnson grass had not been affected to any extent; it came just as bad

the next year. He considered he was badly used. Furthermore, he objected very seriously to the notice in the paper stating that a lien had been filed against his property. He said it gave him a black eye in the community; people thought he would not pay his bills. I think, in enforcing the horticultural law, persons should be very careful not to start something they can not finish.

MR. BANKS. What was the ultimate result of the district attorney's action; did he go and file a lien?

MR. WEEKS. He has not filed a lien yet. The party paid the money, as I said, a short time before the suit was commenced. He paid under protest. He felt very badly about it.

MR. BANKS. I had a case in my county. I ran up against a couple of men who were pretty well fixed; they had a couple of hundred thousand dollars apiece; they were partners. They finally defied me and told me that I could not make them pay. I told them I would serve the papers on them. They paid no attention to it. I pointed out the Johnson grass that was growing in several places, and then they paid the bill and said no more about it.

MR. KELLOGG. It occurs to me that two papers are yet to be read, and I suppose Johnson grass would come under the head of one of those. Wouldn't it be well to defer the discussion until the papers are read?

THE CHAIRMAN. They were not speaking of eradication; they were using that as an illustration of the law.

THE RELATION OF THE COUNTY HORTICULTURAL COMMISSIONER TO THE PEOPLE.

MR. WEEKS. *Mr. Chairman, Ladies, Gentlemen and Fellow Commissioners:* Not that the commissioners are not gentlemen, but as this paper deals with their relation to the people, I will leave it that way and add that the first qualification of a good commissioner aside from his technical knowledge is the ability to act the gentleman under all circumstances whether he feels like it or not. This is not always easy to do. Any one who has ever been a commissioner can vouch for the truth of this statement.

If one has the temperament of a good politician, and can handle men without rubbing the fur the wrong way, he should shake hands with himself every morning as he has something to be devoutly thankful for.

Now, I don't want to have it understood by what I have just said that to have the faculty just described, a man must be tricky and a little off color, for that is not what I meant, as honesty, absolute honesty, is a rule never to be deviated from in the slightest degree. While dishonesty may at times be excusable, it is inconceivable why any one should practice it while discharging the duties of county horticultural commissioner. I will not consider for a minute that any one would be so foolish as to be dishonest with any of the funds that he might be intrusted with, but he might forget himself so far as to discriminate between growers until he found himself in very deep water, and on looking back would be able to see where strict honesty would have kept him high and dry.

That sharp practice ever gains one anything in the long run is a question in my mind, that it never gains a commissioner anything I am very positive; in fact, he has everything to lose and nothing to gain.

Now, brother commissioner, if your relations with the people are to be what the law intends them to be, you must not neglect the least request made of you, if it really comes under the head of your duties as commissioner, and if you are going to attend to it at all, do so as soon as the press of business will permit.

In a good many parts of the State the office of the county horticultural commissioner is a comparatively new institution, and people are not used to it. Since the new law abolishing the old board of three commissioners and making one man responsible for everything that is done, many people consider it to be an innovation, and want to know what kind of new graft this is. In these localities the commissioner is in the nature of a pioneer with all the vicissitudes that attend pioneering in any form. In time this office will be considered as necessary as that of the sheriff, district attorney, or any other county office.

It will facilitate matters very much in this work to have the confidence of the people; in fact, it is a necessity I might say. To gain this confidence from the people you must first have confidence in yourself. When I say this, I do not mean that you must never say that you don't know a thing, for the average man that we come in contact with is an intelligent person, and people of this class know that no one man knows it all. If you come across something you don't know, never guess at it whatever you do. No thinking man is impressed by a mere pretense of knowledge. If a question is asked you, the party asking you has a right to a correct answer. If you cannot give it offhand, say so, and look it up. It is no disgrace not to know everything in such a varied and extensive business. If any one in this audience knows of a lawyer or doctor who is considered at the head of his profession, who never has to look any question up I would like to hear of him.

We find people of many moods and dispositions while discharging the duties of horticultural commissioner, from the alert business man to the foreigner who can barely speak our language. To deal fairly with a class which varies so widely the individual must be studied. No method of approach can be used twice, and once business relations are established one's policy must be governed by circumstances. Take, for instance, the man who knows that you are right and yet objects to the enforcement of the horticultural law from pure cussedness and in the same breath admits that it is all right if not applied to him. To argue with this kind of a man would be a waste of good breath and utterly useless. He will think lots more of the commissioner and have more respect for the horticultural laws if they are enforced in a summary manner, but likewise be perfectly fair about it; don't make it a personal matter. Now, on the other hand, a man who can not read English, and does not understand our laws, if approached in a rough and bulldozing manner will prove in many cases to be a hard customer to handle; perhaps I have made that too strong. If the commissioner does not take time to explain the law, the necessity for its enforcement, and the good to be derived from its existence, he will have the same proposition on his hands. I think that makes my point clear.

One should always keep in touch with the growers of his county. It is the personal note that is the strongest element in the results that we obtain, for much of the good that a commissioner does lies in the influ-

ence he has in inducing people to adopt better cultural methods and general orchard practice. The phrase "personal note" was a suggestion adopted from a live young insurance man whom I am well acquainted with and was in conversation with one day. He said, "You must get close to your prospective risks if you expect to have much business, it is the personal note that counts." As our work is as much a business as insurance, or running a store, or any other line of work, I applied this "tip" to the "bug" business, and believe it makes business good. If you are otherwise qualified for your work, it won't take long for you to become indispensable in your county.

Should it come to you that some one said that the commissioner was a grafter, a bum and generally useless, don't send back word that you don't care a rap for his opinion, but show him by some action of yours that he was very much mistaken, and then read the riot act to him. Remember that you are employed by the people, and if you don't attend to business you can expect a kick, not but what there will be lots of kicks any way, as any public servant, no matter how competent and well qualified, can tell you.

So far I have held strictly to the subject of this paper, "The Relation of the Horticultural Commissioner to the People," but in closing I think it will not be out of place to say a few words about the relation of the people to the horticultural commissioner. Give him a square deal, and try to see how much you can get out of him. Don't be afraid to ask him questions and ask him to do things for you. If he has done something that looks queer, go after him yourself. If you don't think he is attending to business, tell him so yourself, don't hit him in the back. I think from the experience I have had with the people, and taking my case as typical, that if the few simple rules set forth herein are adhered to with reasonable consistency, the relation between the commissioner and the people will be all that can be desired.

In summing up the matter honesty, straightforwardness and good, conscientious work will make the subject of my effort to-night a dead issue. Live growers make a live commissioner.

THE CHAIRMAN. I believe Mr. Hecke will open this discussion, and I am going to call on every grower or horticulturist who is not a commissioner to join in the discussion.

MR. HECKE. *Mr. Chairman, Ladies and Gentlemen:* You have heard a good deal to-night about the tribulations of a horticultural commissioner, and about the many drawbacks that there are to his position. In listening to the paper of Mr. Weeks, there is one note that struck me particularly, and in his paper he calls it the personal note, and in which he meant the talk that the county horticultural commissioner is making with the fruit grower. I have particularly noted this personal note, this bond between the two. Whenever I am making my rounds through the orchards of my county I find that, after the grower and myself have exhausted the subject of insect pests, of spraying, etc., he will commence to speak about the planting of trees, which varieties to use, and the time that they are in proper season. We soon drift into the talk about the market conditions, about the prices of fruit, and where the best places are to dispose of the fruit, what prunes are worth, and what raisins are worth, and so on; and very often I am able to assist

these growers with my advice, for the simple reason that I am able to get around the county and pick up a little information here and a little information there. There is another subject that growers are very apt to discuss with the horticultural commissioner, and that is the question of labor. There, again, the horticultural commissioner will always be able to give some advice to the grower. And when such laws are published before the farmers of California, as for instance the employers' liability law, there again is a subject that the grower can discuss with profit with the agricultural commissioner. This employers' liability law is bound to work a great hardship upon the fruit-growing industry of California if it is carried out as it is intended to be; and there may be a possibility, if the farming communities are pulling together, that some of the vicious features of that law may be modified; so, after all, while the horticultural commissioner's position is not always a satisfactory one, there are points that make it pleasant once in a while, anyway.

With the growers I find I am getting along all right. I am also getting along well with my board of supervisors. I know exactly what they want me to do. I am consulting the board, and I know that they are going to back me up in whatever we desire to undertake.

MR. PEASE. *Mr. Chairman, and Ladies and Gentlemen:* I would like to say one or two words on the question of the relation of the County Horticultural Commissioner to the people. My idea of the commissioner's business is this: While he should not be easy and use discretionary power differently towards different people, still, it is not necessary for him to be too short off in giving his orders. I remember at one time I was connected with one commissioner and he took this view of it. He said that if this county horticultural law is good we want to enforce it, and he said if it is not good we want to fight it out and have the law abrogated right off. His idea was to go at it hammer and tongs, and go up to a man and say, "Here, you are maintaining a nuisance, and I give you so many days to abate that nuisance," and not give him any talk. My idea is that if the commissioner is better posted than anybody else in his county, that he should go to the man and bring to bear all the arguments why this law is good, and he should, if possible, prevail upon the man to abate these nuisances. For instance, there are a great many things that happen in the commissioner's dealings with the people which would make good arguments for the people. I know in my county the people objected to fumigating. They thought that spraying an orange tree or a tree with the foliage on it was just as good as fumigating, and the real effect of that is that as long as one man sprays in among a lot of orchards where everybody else uses the fumigation process, and does a good job, this one man that sprays might find that he is maintaining the scale, and as long as he maintains the scale it will breed and spread back on these people, and they will go to the expense of spraying sooner than they otherwise would. One little experience in my mind brought light to a great many people sooner than could have been otherwise done, showed them the benefit of how much money was paid by fumigating or using the best method. I know there were two carloads of oranges sent f. o. b. to be delivered at Denver. The cars were delivered at Denver, and upon inspection some were found with scale. They were turned down. Most of the commissioners

know there are some sixteen states besides Canada that have laws that they will not receive fruit with any kind of scales. Another man had an experience besides these. A man shipped a carload of oranges up to Oregon. That carload was taken out and burned. If you could bring such arguments as these to bear, they will show in a moment that it is practically the only thing to do, to fall in line and do as the commissioner requires. Certainly, if any man refuses after you bring these arguments to bear upon him, if he refuses to abate the nuisance, then it is the duty of the commissioner to go ahead and abate the nuisance.

THE CHAIRMAN. Mr. Kellogg, you not being a commissioner but a fruit grower, I would like to have you discuss this subject from the orchardist's standpoint.

MR. KELLOGG. Mr. Chairman, in Placer County we are making every effort to get our fruit to market in the best manner possible. In this scale business we call in our county horticultural commissioner, and he is backed up by the citizens there to perform his duty in regard to anything of that kind. The shippers, as well as many of the growers—most of them—are emphatic in the strict observance of horticultural laws. I do not know whether I am answering your question or not.

THE CHAIRMAN. Yes. I want to know the sentiment of the fruit grower in favor of or against the horticultural commissioner.

MR. KELLOGG. Very much in favor of him. We are pleased with the law and insist upon its enforcement. [Applause.]

MR. BOWMAN. From the standpoint of a grower—while I am not very well versed regarding the feeling of the grower in his county with the commissioner, I would say that if I am retaining smallpox in my house they go ahead and quarantine it without asking any questions, and I do not believe that having smallpox is a bit more harmful to the community than retaining insects in my orchard, and I do not know whether it is necessary for a commissioner, when he knows a man is retaining insects, whether he is entitled to go to him with a very plausible argument towards the law in eradicating it or not. It seems to me that it is his duty to tell him what his duty is before eradicating the pest, and then see that he does it. There are a great many of us who try to evade the law, not only in that respect, but in other respects. I believe it is characteristic of the American people to get as far from law as they possibly can. My own observation has taught me that a great many think there is a great deal of foolishness about fumigating and spraying our trees, and I think it is the duty of the commissioners to see that the trees are fumigated without asking the consent of the owner.

THE CHAIRMAN. Are there any other remarks upon this subject?

MR. CUNDIFF (of Riverside). I was very much pleased with the point brought out by the gentleman in his paper. In the first place, the commissioner should be a man that is courteous and tactful in getting along with people. Of course, we are enforcing an arbitrary law. When we speak of law, it is arbitrary, or it would not be a law. But as a matter of fact, in any community, any county, especially where your horticultural law is of recent date or recent origin, it takes time to cultivate a feeling of friendliness to the objects of the law. Now, that can be done to a very large extent by a tactful and diplomatic course of conduct towards the orchardist; or, on the other hand, I have

known cases, and it sometimes happens, that inspectors, unless they are very carefully instructed, assert too much authority. It is very much better, even if the policeman out on the street finds it necessary to arrest a man, for him to walk up and quietly say to him, "Here, you are breaking the law and I will have to take you up to the office." The proposition of the horticultural commissioner is to educate the man as far as possible as to the pest that he may be afflicted with in his orchard, and the necessity in protecting his own interest, in the first place, and secondly, the coöperation with his neighbor that he does not damage his neighbor in allowing these pests to spread. The man who takes that course—I am speaking from some experience; I have been commissioner of the county I am in for thirteen years and actively on the horticultural work seventeen (four years as an inspector), and I am dealing with as good a class of people as in any county—people of different minds and people largely who have come to us without agricultural experience, largely people who have left the East who have followed trades, manufacturing industries, and come out here and bought an orange and fruit orchard, and they embark in this business probably without having heard of a scale in their lives, and the first information they have that there was any such trouble as that is a notice from the inspector or the commissioner that it is necessary for them to fumigate or clean up their premises. Naturally a man does not take that very kindly, because it is an expense he has not figured on; he has not taken into consideration managing a crop in this way. When he comes to pay anywhere from two to three hundred and fifty dollars to fumigate an ordinary ten-acre lot, it is like throwing a bucket of cold water on him. Go at a man like that and explain to him the necessity of doing it, how, if this orchard goes for any length of time, it will bankrupt him, and beyond and aside from that, that he is inflicting this trouble on his neighbors. In nine cases out of ten, with anybody who is reasonable, you can bring a man to sense on any such proposition. Whereas, if you go to a man and say, "I will give you so many days to clean it up or else I will file a lien on the property," the man may perhaps know that is a fact and have to submit to it, but at the same time, if you will talk the other way and explain the law to him, you will make a friend instead of an enemy, and the horticultural commissioner will make enough enemies. It is largely an office that can be educative, instructive. The average farmer does not know but very little about these pests. It is not their business, and the more you can show and explain the value of these remedies and why—and sometimes they object to the cost, the cost of the fumigation—take pains to explain what their share of the operation costs, the material, the labor, and all these things, and I believe that in any county—of course, there are exceptions among any people—nine out of ten orchardists can be drawn around to be a friend of the horticultural commissioner and absolutely coöperative.

MR. GARDEN. It seems to me—whether these things are intentionally done or not, I do not know—the horticultural laws are so plain that the county commissioners may use discretion. The duties of the county horticultural commissioner to the people are the same, I believe, as are the duties of the state commissioner, and if the county commissioner was as rigid as an iron rod, I believe myself he would accomplish very little. I believe the Governor of Oregon is showing a splendid

spirit and he is accomplishing good work in putting a man on his honor. All men have honor, and it would be wrong, then, to treat them in any other way than if they were entitled to a like consideration. I have found it in the county where I operate that where I have taken this position, and without any reason go right into a man's orchard and demand that such and such should be done immediately, I know that I could never have done it. I believe I have more classes to deal with than in any other county that I know of. There are several hundreds of men, good men, good orchardists, who can not talk the English language, in San Joaquin County, yet they grow good trees; but there are no orchards that are absolutely clean, and there is no such thing as eradication of the insect world; at least, to my knowledge, I do not know of any insect pest that has ever existed that any one can say it has been eradicated. And if you go into a man's premises and you demand that such and such be eradicated when you yourselves know that an eradication is impossible, it is a very unreasonable proposition; and if you undertake to eradicate that pest, you yourselves know that you can not eradicate it; so, therefore, it seems to me that the duties of the county horticultural commissioners are a good deal as one of our commissioners remarked in regard to the spray for thrips—that as well as being mixed with lime, it requires to be mixed with a good deal of common sense, and if one uses a good deal of common sense and judgment, he will accomplish much.

MR. GALLOWAY. I heartily agree with Mr. Cundiff in his position in regard to our relations with the growers; that is, that we should at all times endeavor to coöperate with them and secure their good will just as far as possible. My experience has been, if you can get a grower who will do his work from self-interest, it would be much better done than if you attempt to force him to do that against his will. He will probably go through the form of doing the work, make a pretense of complying with the law, with very poor and indifferent results; but if you can get him to coöperate with you, you can get him to see that it is to his interest to do the work, and give him proper instructions how it should be done, I believe you will accomplish a great deal more than you would to attempt to do the thing in a summary manner. As Mr. Garden just said, I believe it requires a great deal of common sense and discretion on the part of the commissioner if he is going to accomplish the results that are expected of him. There may be extreme cases where eradication is possible, where a new pest is just entering your county, where it is necessary to eradicate and where that is the thing to do, but as Mr. Garden said, there are many things we know we can not eradicate. Their host plants are among the wild growth, and it is utterly impossible to attempt to eradicate them; and in those cases I think the thing to do is to use common sense and do the very best we can.

Now, suppose we serve notice, for instance, to some of our growers in our county to eradicate the thrips. We know they are entering our county; we discovered them for the first time last year. After the experience of some of our counties about the Bay in eradicating the thrips, it is very likely they will refuse to do so and require the commissioner to do the work. The commissioner would have a considerable of a job on his hands, for the thrips are not a very easy thing, as I understand, to eradicate; and the thing to do, it appears to me, on the

part of us commissioners, is to try to influence our growers from self-interest to do the work; and in that way I believe it will be better done, a great deal, than it will be if they force them against their will to do the work. As I have said before, they will go through the form of complying with the law, and you do not know, unless you are right with them, what they are using, and they will put it on in a very indifferent, careless manner that will secure very poor results.

MR. HUTCHINSON. There seems to be with all the commissioners an idea that they will make some growers mad, or offend them very much if they ask them to do their duty. Now, there are a great many growers in the State that do not know what they ought to do; and it seems to me that it is the duty of the commissioners to find such people, and if they find anything wrong notify them. They need not go at them with hammer and tongs and make a big noise about it, but they will tell them. Now, the only thing between me and the commissioners would be, that they did not do their duty; they did not come to me and tell me, if there was something going wrong with my place, that I did not know of. We live in an irrigated district, and we are troubled more with weeds than you outside—very much more—and the only fault that I have heard from the growers—the most successful growers, anyway—in our county is that we are not notified of any trouble, or the commissioner does not come and force us, as we term it, or tell us what we should do. Now, there is no necessity, it would seem to me, for there being any friction between the commissioners and the growers. The commissioner is working for the growers, and he is paid by the growers, and we look at it in this way, that he should look after our interests as much as is possible and give his whole time to it. I have known of a great many cases in my county—I think the people here from that county will agree with me that I am called a crank as far as I am concerned, and my crankiness is in this way, that I do not have enough to do. I do not know of anything wrong on my place without I look after it, but if they will come and tell me they will find me at work at it right away. Years ago one of my neighbors was ordered to spray his pear trees; there was a good deal of scale in that country at that time, and he took the stand that he would not do it. I had been spraying before that and the Chinamen had not put on the spray satisfactorily to me and I made them go over it again, and the blossoms were coming out then on the peach trees, and they went over it pretty thoroughly after that. They were a little mad at me for making them do it over again, and they brought up the question. My neighbor was ordered to spray his pear trees and he would not do it because he said that "my neighbor over there had sprayed his trees and killed all his fruit." It did look as though it was killed, but I will state that I have always thanked that commissioner for coming over and telling me what I should do; and while they thought I had killed everything on the trees, I had the biggest crop, for young trees, that I ever had, and I do not believe that a grower that is entitled to the name of California fruit grower would ever be offended at men if they came and told him and warned him to do something for his own benefit.

MR. BLOOMER. My personal experience is that I think the first time we meet a grower or orchardist or vineyardist or pear grower, if he has a nuisance—it may be an insect pest, Johnson grass or some other nuisance—if we talk in a friendly way with him and get him to abate

the nuisance, and get him to promise that he will eradicate it, and try to get him to set some definite time when he will begin or when he will get it done, and then go back afterwards and at that time—probably a week usually—if he has not started by that time and has not some reasonable excuse, and it is necessary to give him further time, and then the third time we go back and we do not find something done and he seems to be stubborn about it, that is the time to serve a legal notice upon him. It has been stated here by Mr. Garden and Mr. Galloway that we have to use common sense about this matter, and I believe that ninety-nine out of a hundred want to do the right thing, and I believe in giving every man a square deal.

MR. ORENSEN. I have been much interested in the remarks made by this growers' convention. My true belief is that from the remarks made here by commissioners that they are more afraid of offending the farmer than the farmer is of being offended by them. That is my true belief about it. Psychology teaches that a man will very often convey to another mind the force of his own mind, and being very much afraid of offending a fruit grower, he may possibly convey the impression that he is afraid.

MR. GARDEN. I fully endorse what the gentleman just said. He says that the commissioners are more afraid of offending the farmer than the farmer is of being offended by the commissioner. If a commissioner goes up to a farmer, and he knows that he has got the law on his side and he has got the power to use it, but he has got the common sense to give that man a good talk, given to him in a nice way, show him his duty, show him what it is for, he will rarely offend. I always approach a man in full confidence that I have the law on my side, but that it is the last thing to use, only when it is necessary. [Applause.]

MR. WETZEL (of Siskiyou County). I will state, in starting out on this horticultural business, that it has not been conducted to any great extent in Siskiyou County, and it was something entirely new. The conditions of the great number of the orchards there were something fierce, and I felt that I could not go and tell the orchardist, "You must do such and such," because such had formerly been done, and a great many orchardists have used sprays, as they said, and they had proved ineffective. Some of them had sprayed for some seven or eight years. I had to take all those circumstances into consideration, and I had to meet the circumstances just as they were. I consider that the best I could do after spraying was to take some of those orchards that were so isolated from others, spray them, and demonstrate the conditions, show what the result would be. When you show a man that you are working in his interest, you can have him work with you; and if you can not, if you show him that his expense and the work is of no effect, he is not going to do it, and he is not going to be driven to do it. Such is the character of American people. And by this means I have gone through in the summer time and shown them the conditions from insect pests in parts where we didn't spray. The people, you might say, consist of three different classes. There is the man who wants to spray his orchard and understands it; I guess there is about 90 per cent of the people who want to spray and do not understand it; and there is probably one out of every 200 who does not want to and tell about it. Those who do not want to, I necessarily serve the notice on; and I can

state, Mr. Chairman, that I have had good success. There have been several instances where people, who as I was well aware, knew considerable about the different pests, and they had tried every means possible to determine what I knew about this. On seeing that I understood what I was talking about, they were strictly with me, and I can say that in Siskiyou County at the present time I have, well, a larger part than 99 per cent—most every one is well satisfied, and they all want me to come up to the orchards. I received a request a few days ago from a man to come up and spend a couple of weeks at his place, and he would pay me personally if I could possibly do it. Those are the results that I am receiving, and the results are certainly good. And I have been requested strictly by the people of the county, and by the board of supervisors, to closely inspect the alfalfa seed and everything else that is shipped into the county, and I have been following out those instructions very closely. I found it a good idea to inspect the alfalfa seed closely, and if there is a close inspection made on the nursery stock and alfalfa seed and other stuff that is shipped in, and it is understood on the outside, *you will soon get nothing but what is first class*. At the commencement of the inspection of alfalfa seed it was pretty badly adulterated, but the last shipments have been first class. And it has been the same with scales. I was called to the railroad to inspect some potatoes, and I arrived in Dunsmuir about eight o'clock, and there was a carload to be unloaded the next day. It was supposed to have been shipped from Oregon. I had my doubts. The man to whom those potatoes were to be delivered looked at them, and there was another man there, who was an agent who was shipping them in. He got some of the sacks and found that the potatoes were spotted inside and started from the center. The agent who had shipped them in was not very eager to have them inspected, so that he ordered the car on to some other place. The next morning the car was gone. There have been five cars of potatoes shipped out of Siskiyou County under the same conditions.

THE CHAIRMAN. If there is no further discussion on the subject, it is getting along late, and we had better proceed with the next subject, which is along the same line in some respects, and to my mind is one of considerable importance, namely, the Relation of the County Commissioner to the State Commissioner, the Agricultural College and Rural School. There has been a good deal of talk about teaching agriculture in the public schools, and I think it will be of considerable importance, Mr. J. B. Hickman.

RELATION OF THE COUNTY COMMISSIONER TO THE STATE COMMISSIONER, AGRICULTURAL COLLEGE AND RURAL SCHOOL.

To the State Commission.

MR. HICKMAN. Unfailing loyalty, not only to the State Commissioner, but to the entire body of county commissioners and deputies, should be a test of honor with all of us. Captious criticism should find no place in our attitude. The field is too broad for any one method or practice to cover, and conditions in any section of the field may vary greatly with the years and seasons. There is but one cause for our efforts—the greatest good for our State and its workers.

As an illustration I give this season's experience with the black scale. In the northern and eastern section of my field, black scale on the apricot has been attacked during the past years by *Scutellista cyanea* in such numbers that I had concluded this parasite kept the pest in check, cleaning the scale up, and starving itself out by a lean year and, when the scale increased, returning to the attack or requiring reintroduction.

I knew Mr. Volcke was of the opinion that climatic conditions rather than parasitic influence kept down this scale, and Mr. Essig was skeptical of control by the *Scutellista*, so when the first of November brought a decided increase of black scale that extended to a general infestation of many cot orchards by November 27, and I found larvæ of *Scutellista* extremely scarce, I concluded that kerosene was the only immediate source of relief.

The State Commissioner at the head of our system is in a better position to view the field than local commissioners can be, and conditions may frequently arise when prompt and positive action to carry out instructions may be necessary. Reports of local conditions are always invited and discussion is free, both in our communications and meetings. The discussion on control of thrips this afternoon foreshadows a try-out of methods side by side, later on, and choice of the one that is suited to conditions.

To the University.

To one who looks back on the early period of the University of California and recalls prevailing conditions, he can but wonder at the blindness of our rural population in failing to appreciate the efforts that were made by the University to help him from time to time. There could be no growth till support was freely given.

The great change in recent years which has brought us courses in most of our lines of horticulture and agriculture, economics and conservation, demonstration trains and the state farm at Davis are but evidences of what the University has been ready to give, and our rural people generally were not ready to accept. Many farmers are now enthusiastic in grasping the opportunities offered. The short courses are thoroughly appreciated and endorsed. The present attitude of our University toward our rural schools in organizing agricultural clubs; the examination and testing of seeds; and the establishing of plant-breeding stations will be productive of immeasurable good. Every opportunity a commissioner has to put a man, woman, or child in touch with the University should be welcomed and made the most of. In such a great State as ours, with every pair of rural eyes directed to its fields, many years would fail to complete a survey of its actualities and possibilities. Every commissioner should consider himself an authorized agent of University extension until all our country population feels itself in touch with the University.

To the Rural Schools.

For many years intelligent, thoughtful people have realized that the adoption of a city school system for rural schools was an error. It did not serve the needs of the communities intended, but worked a positive injury, besides tending to depopulate the country, and crowd the city. The surprising feature of it all was that the educational system of the city did not fill the requirements even of city needs, and we find

vocational schools in all progressive cities to-day. Despite protests against the system by such men as Mr. Dore and Mr. Berwick, resolutions from granges, from patrons of husbandry, from the Commonwealth Club, and Country Life Commissioners, the best that could be obtained was a poor provision for nature study, leading courses of study with lumber lacking in usefulness and detrimental otherwise.

For years our normal schools did worse than nothing; our teachers were disciples of superfluity and city vanities, and, with rare exceptions, the possibilities of country life were ignored or ridiculed. Petty city fads and formalisms were foisted on unprotected children as desirable features of education, and from the University down hardly a real educational ideal was visible. An agricultural college turning out lawyers, high schools turning out clerks and would-be bookkeepers, the real educational development of children in city and country crushed and replaced by memorized stuffing. Pitiful tragedy—the destruction of helpful development!

In far too many rural districts ideals are no higher to-day, but in many the school garden has come to stay; improvement of grounds is carried forward and helpful teachers are appreciated. The time is ripe for the extension of Professor Stebbins' Junior Gardening Clubs to every district in the State.

Professor Babcock's article on the Redirection of Public Schools, in the *Rural Press* of November 11th, is of so much value that I ask every one of my hearers to read it.

What can a horticultural commissioner do to further the good work? He is in touch with the agricultural department and with our own agricultural college. He can suggest to the teachers (many of whom are still helplessly struggling in the meshes of traditionalism), that they make use of the department publications, such as the interesting story of the Boys' Corn Clubs, or the Girls' Tomato Clubs. He can advertise the plans of the California University to organize Junior Gardening Clubs in school districts, now being developed by Professor Stebbins, and the state-wide agricultural and horticultural contest arranged for, with prizes, etc., and he can spread abroad statements of results he notes in home vegetable gardening.

He can meet the objection, "lack of water," for a school garden by the statement that water is often a hindrance rather than a necessity, that beautiful wild plants grow in the driest sections and a mulch of loose soil, of sand, or leaves, or old straw will suffice to retain sufficient moisture the entire growing season, and not reduce soil temperature as would irrigation; or, that a garden of wild plants would furnish rare blooms throughout the year. He can suggest that the little flat at the bottom of a ravine may be made more productive than 160 acres in some other locations. I have in mind such a spot of less than three acres, for plowing which a man was criticised because it would feed his cow most of the year. To-day he feeds two cows, two horses, numerous pigs, chickens, all his family, and his bank roll from that same plot, and counts the rest of his ranch as little more than incumbrance.

The helpful attitude of the horticultural commissioner to rural schools might well be extended to the community. A teacher in a normal school recently told that she had just delivered a lecture on the Sabine Hills to an improvement club located in one of the richest horticultural com-

munities in the State. I was familiar with some of the works of that club, and not a member of it knew the beauties or possibilities of the hills surrounding them. Is it strange that the high school in that community had no course in horticulture to offer a newcomer who wished to complete a course begun in Minnesota and later take a horticultural course in our State University? [Applause.]

THE CHAIRMAN. The secretary informs me that some of the commissioners have come in since the roll was called. Will they please give their names as being present? We would like to know at the end of this session how many commissioners were present. It looks to me now as though we would have 99 per cent of them.

I will now call upon Earle Mills, of Oroville, to lead us in the discussion of this paper.

MR. MILLS. That was an excellent paper, and contained a number of points that particularly appealed to me. The commission merchants very frequently do appeal to the state officers. Of course, they are justified in so doing, because it means a loss of a good many hundreds of dollars, and I think with a very few exceptions the State Commissioner has stood by the county commissioner as regards the status of the county commissioners.

THE CHAIRMAN. Is there any old-time school teacher here of past days that can say anything upon this? I would like to have them express some of those ideas. I was thinking if some of the fruit growers that I have come in contact with in my county had only been here and expressed the ideas they have expressed to me and to individuals about me, it would be a very interesting discussion indeed, and I feel the same way about these school teachers. Do they consider that the county commissioners have been or can be or should be of any advantage to the rural schools?

MR. MARCHBANK. I wish to say on this point that the high school teacher of Madera has been in touch with me oftentimes in regard to the horticultural plat he has there, and has invited me to come out and give them instruction in the early part of January.

MR. McLAIN. Coming from Australia fifteen years ago, I, of course, know something of the conditions there. The schools have adopted a system of teaching technical education along the lines of the discussion here, and it is astonishing as well as gratifying to note the result that the children are obtaining.

MR. BEERS. In Santa Barbara County there is quite a harmonious coöperation between the horticultural commissioner's office and the county superintendent's office. All of the publications that have been issued in the horticultural office have been made use of by the county superintendent, and have been carried into the schools and have been read and made an object of interest to them. Moreover, those bulletins that have been issued by the University that could be used to an advantage among the teachers have been asked for—usually about 200 at a time—and these have been put in the hands of the teachers, and there has been hearty coöperation there. All of these valuable publications that have come from the horticultural commissioner's office—copies of them have been supplied the county superintendent and she has taken pains to take extracts from them that are interesting in certain sections of the county, and presenting them to the teachers in such a way that

the teachers are using them in their work. We happen to have a superintendent that is quite interested in this sort of thing—very much interested. We have a superintendent that feels that nature study among the younger pupils of the county is more valuable when given along these practical lines than when given along the line of story-telling and mythical relationship, such as has been the habit of the instruction usually given in nature study; so that in our county or in Santa Barbara County the relation has been very intimate, and I rather think that it will be productive of a great deal of usefulness. Now, in all this work we have found that the relation existing between the local commissioner and the state commissioner is very vital. There is nothing that is of any use or value, or of intensity of interest to Santa Barbara County that is not intensely vital to the State Commissioner of Horticulture; naturally so, so that the relation there is always cordial. This has always been reciprocal, I think, in every respect, and the nature of the discussion and the nature of the paper here to-night on this subject brings out that relation that should exist, and I presume does exist. The fact is that there is no difference in myself since I was elected or appointed to this commission than there was before. I am the same fellow I was before. I own the same house that I lived in before; I have the same neighbors and the same relations to the farmers, and the people that live in the county, and I am nothing but one of them, just as I was before and will be when somebody takes the job I now have, and I can not see how there can be anything but that relation between us that has always existed. I have no sympathy with the sentiment that because a man is appointed to a position he has therefore become a ruler. I can not conceive of a ruler in a republic, and therefore our relation is mutual and cordial and coöperative and helpful and instructive and respecting. I have learned many things from the farmers. I am quite sure that many of the farmers have learned something from me, and in that way we work together. If it becomes my duty as an executive officer to enforce a certain law against some man who is at variance with his neighbors, I do it; but I am not hunting around for that sort of a job, and I am not trying to make a place to show authority. It seems to me that the relationship that should exist between the commissioner and his people and the commissioner and the state commissioner, and the commissioner and the university, the commissioner and the school, should be that helpful relation that should exist between these people anyhow.

MR. KELLOGG. This convention was moved this afternoon by the eloquence of a gentleman, and was greatly touched and shocked to perceive the gentleman borne from this room, in the arms of others, incapable of going from the room himself, and presently he was reported dead. We adjourned then out of respect to the memory of that gentleman. We have not forgotten his impassioned appeal that he made to us in behalf of others, but I believe it to be fitting at this time that we offer a resolution in regard to the matter, and if you will hear it, I will read.

THE CHAIRMAN. It is in order.

MR. KELLOGG. (Reads):

WHEREAS, In the providences of God, our associate and fellow horticulturist, Homer A. Craig of Campbell, California, has been called from his field of labor and

usefulness this day to his eternal home, stricken while pleading for the betterment of our race, for an opportunity for young men and young women to have a chance to assist in the harvest, and improve their means for self-support; pleading that they might be privileged to get out of the cities and breathe the fresh, pure air of God and enjoy His blessed sunshine; therefore, be it

Resolved by this fortieth session of the California State Fruit Growers' Convention, That we extend our condolence to the family of the deceased with an expression of our high regard for his moral worth and Christian integrity, and commend them for comfort to the Savior who came to preach the gospel of peace and good will to the laboring classes of the world.

Resolved, That a copy of these resolutions be given a page on the journal of our proceedings, and a copy be sent to the family of the deceased.

Resolved, That we do now, again, adjourn this session out of respect to his memory.

THE CHAIRMAN. The meeting stands adjourned in accordance with the motion.

MORNING SESSION—SECOND DAY.

THE CHAIRMAN. We will be favored this morning by a piece of music, a quartet by four of the young ladies of the high school. There will be two numbers, one "The Silent Night," and the other "Away to the Field."

After an entertaining interlude the proceedings continued as follows:

THE CHAIRMAN. Will you please rise, and we will be led in our worship by the Rev. L. R. Fullmer of this city.

After the invocation the proceedings continued as follows:

THE CHAIRMAN. I may pause a moment to express my great satisfaction at the delightful meeting I enjoyed with the rest of you last evening. It seems to me that kindly spirit is going to tell, and I congratulate you in having so good a body of men interested in all that interests the fruit growers.

It was stated last night that an insect has never been exterminated. I suppose that has been refuted in our own State. I suppose that Mr. Carnes actually wiped out the white fly in two or three cases. [Applause.] It seems to me that is almost glory enough for one man, and he also is the man who built the insectary, and you have seen his work. It is a great pleasure to have Mr. Carnes with us this morning, and he will talk about the "Mediterranean Fruit Fly." We will now listen to Mr. Carnes. [Applause.]

THE MEDITERRANEAN FRUIT FLY.

(*Ceratitis capitata*.)

MR. CARNES. The subject assigned to me on the program is the Mediterranean fruit fly. To cover the history of this insect in all the countries of the world into which it has forced itself, together with the resultant damage wrought to fruit growing in these countries by reason of its presence, would require a volume and would cover the history for eighty-six years of what is universally acknowledged as the most destructive fruit pest in the world.

As a strictly business proposition, I believe there are but two phases of the present subject in which the fruit growers of California are vitally interested—

First—The real status of the pest in the Hawaiian Islands, coupled with authentic verification of its seriousness and the likelihood of its being introduced into California.

Second—Is the State, through her horticultural quarantine officers, equal to the present emergency, and what is being done to provide future protection?

In order more intelligently to comprehend the nature of the pest with which we have to deal, we have thought it advisable to present several enlarged drawings of the insect in question; also, to give a short, popular description of the same in its various stages, together with an exhibit of actual specimens taken both in the islands and at San Francisco.

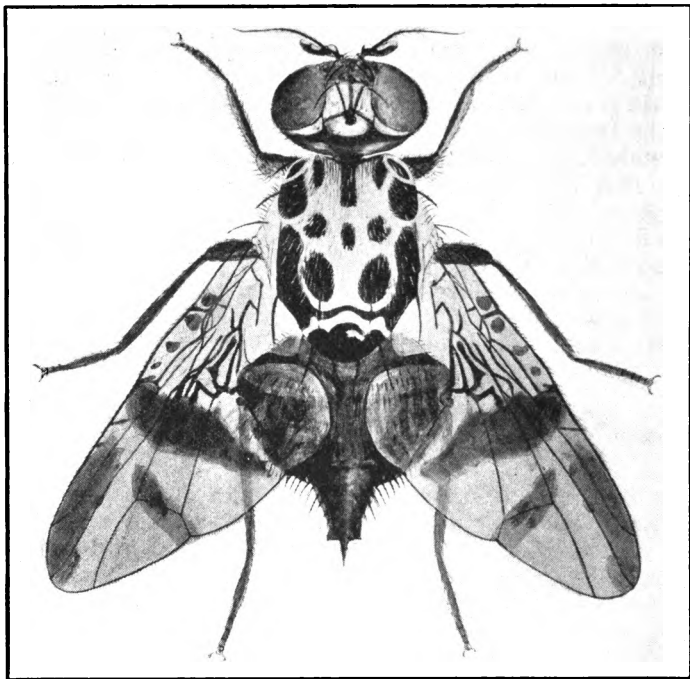
The growers, as well as the horticultural officers present, ought to familiarize themselves with this pest, so that they will be able to recog-

nize the same and immediately report any suspicious cases, as it will be shown later that the pest was in the islands some time before it was reported, and there exists the possibility that stray specimens might have been brought in before active measures were adopted or before its presence became known in the islands.

By carefully noting the drawings presented, as the description is read, you will be better able to fix the peculiar markings of this species in your mind.

Adult Female.

The adult in size and shape closely resembles a common house fly; at a glance you would call it light brown in color. The most striking



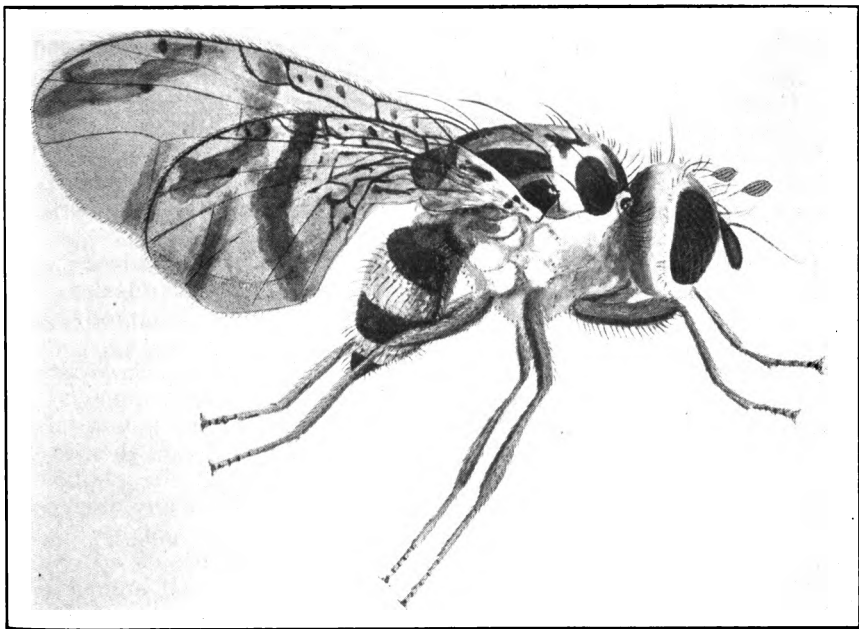
Mediterranean fruit fly (*Ceratitis capitata*). Female. (Original.)

characteristic quickly noticed would be the banded wings and the peculiar drooping manner in which they are carried when alive. The drawings were made from dead specimens. Upon closer examination, you would notice the shiny black and white markings on the thorax (the second or intermediate region of the body), which are so arranged that they resemble mosaic work. The eyes are large and reddish-purple in color; the legs are light yellow. On the abdomen are bands of two colors, white and purplish brown, running transversely around that portion of the body; the antennæ black, with very pronounced thickenings at the base, which are pale yellow. The entire body contains more or less stout bristles. The tip of the abdomen appears to be sharpened into a needle-like point; this is the ovipositor with which the female makes the incision or puncture in the fruit, into which the eggs are laid.

Adult Male.

The male differs slightly from the female, being somewhat smaller. The most striking feature is the two hair-like appendages that stand out in front of the head, on a line with the eyes, and which are widened at the tip, flattened and diamond shaped.

The female deposits her eggs in the ripe or nearly ripened fruit. The eggs hatch into maggots, white or yellowish white in color, varying somewhat according to the host fruit. They are blunt at one end and very pointed at the other, attaining the size of nearly half an inch when fully developed. These maggots reduce the pulp of the fruit to a soft, spongy mass, causing the fruit to prematurely ripen and drop, usually bursting open when striking the ground, thus releasing the maggots that



Mediterranean fruit fly (*Ceratitis capitata*). Male. (Original.)

spring about and jump after the fashion of cheese skippers, quickly entering the ground to various depths, owing to the texture of the soil, underneath the fallen fruit. Soon after entering the ground, depending somewhat upon climatic conditions, the maggot changes into the pupa; from this stage the adult fly issues, to renew again its work of devastation. In Honolulu, with an average temperature of 73.6° , the life cycle is about twenty-six to twenty-eight days.

A more complete account of the nature of the insect appears in the preliminary report, which is found on page 3 of our new Monthly Bulletin, copies of which are now available. Every interested member of the convention should procure a copy of this bulletin, which covers more in detail the results of my investigation.

You are now more conversant with the nature and general habits of the insect with which we have to deal, and I believe we can now revert

to the first mentioned phase of the subject, that is of immediate and pressing importance. For the sake of brevity, I shall attempt only to summarize the report of the existing conditions as I found them.

From the best authentic information available, it appears that the Mediterranean fruit fly has been on the island of Oahu, upon which the city of Honolulu is located, for at least two years, and probably longer. It is now firmly established in practically all sections of this island, and it has also been taken on the adjacent island of Kauai, known as the Garden Island. I did not find it on the island of Maui, but, owing to the limited time assigned to my investigation, to cover the entire territory was impossible; moreover, the realization came to me that our real problem was the island of Oahu.

On Oahu the following fruits and vegetables have been attacked:

All species of citrus fruit.	Wild guavas.
Peaches.	Alligator pears (bruised and fallen).
Figs.	Strawberry guavas.
Grapes.	Papaya.
Rose apple.	Sapota.
Star apple.	Carissa arduina (South Africa).
Mangoes.	Also string beans and peppers.
White lemon guavas.	

In addition to this list, the known host fruits include—

Egg plant.	Persimmons.	Pears.	Shaddocks.
Coffee.	Grenadilas.	Nectarines.	Mandarins.
Plums.	Maupi fruit.	Loquats.	Mammee apples.
Cherries.	Apricots.	Apples.	

So far the banana and pineapple appear to be immune from attack, but close inspection should be maintained for future developments.

The fly has spread from the lower cultivated areas, and is now infesting the wild guavas on the sides of the mountains, in the gulches, on the plains and in the uncultivated portions of the valleys. In addition to the wild guavas, which are almost continually in fruit, many other wild fruits that are hosts grow in abundance; also, large patches of the prickly-pear cactus are to be found all over the mountains. In other countries this fruit carries the flies over winter, and will undoubtedly prove a host fruit in the absence of other hosts.

The worst infected portion of the Island of Oahu is the resident section of the city of Honolulu, and it is from this plague spot that California would be most likely to become infected. This is the section visited by all tourists stopping at Honolulu, and it is from this district that they procure the tropical fruit which finds its way to the port of San Francisco.

I will not attempt at this time to enumerate the many avenues through which the pest might possibly be introduced, beyond saying they are legion.

Notwithstanding the fact that a most rigid quarantine is in force against all island fruit, except pineapples and bananas, and these under certain restrictions, fruit and vegetables infested with live, wriggling maggots continue to arrive on almost every vessel coming from the islands. Many and devious are the ways and means resorted to by certain travelers to escape the enforced inspection at our ports in an attempt to land tropical fruits, which now bring extremely fancy prices in the California markets.

It may be argued by some persons, quite without knowledge of the subject, that this insect, supposedly of tropical origin, might not thrive under our California climatic conditions. In answer to this argument I will state that this specimen has hibernated for seven months at a temperature of 32 degrees and issued. My advice to the growers of California, after viewing the activities of this insect in the islands, is *not* to take any chances *with this pest*.

The so-called fruit industry of the islands, outside of bananas and pineapples, consists practically of what fruit is grown in the dooryards in the resident sections. In these dooryards, which are quite large, can be found practically all varieties of fruits grown in California, in addition to the tropical fruits peculiar to the islands. No systematic order has been followed in planting, and a majority of the yards present the appearance of a tropical jungle.

Being more or less familiar, as you are, with the fighting of insect pests, you will realize how these conditions, as compared with straight orchard planting, add to the difficulty of the problem of control or eradication. Plainly speaking, this insect stands in the same relation to fruit that the blow fly does to tainted meat. For this fly it is only a step, as it were, to California from Honolulu. There are many possible avenues of entrance and nothing stands between us and invasion but our quarantine department. Almost daily this division intercepts infested shipments at San Francisco. The seriousness of the present situation must be apparent to any thinking man, and while I have no desire to alarm our growers unduly, neither do I wish to underestimate the danger present.

This matter is one of vital interest to every individual in the State, as it strikes either directly or indirectly at his prosperity, because of the fact that the welfare of the commonwealth, its existence almost, depends fundamentally upon the great fruit industry.

In dealing with the second phase of the question, as to whether the State is equal to the present emergency or not, we can not help but point with pride to the past achievements of our quarantine department, with special reference to specific cases where we have had to deal with other species of this same family, particularly the melon fly, which is a close relative of the Mediterranean fruit fly, and which has been in the islands for fifteen years; and although it has arrived time and time again at the port of San Francisco (the writer having personally taken it many, many times during the years he was connected with the quarantine service), and continues to arrive, yet it has never gained admission to the State. But we must also realize that the Mediterranean fruit fly has one hundred chances to be brought in, where the melon fly (*Dacus cucurbitæ*) has but one, as vegetables are rarely shipped to California, while tropical fruit is being constantly shipped.

We also have the Mexican orange maggot (*Anastrepha (Trypeta) ludens*), duplicating the above performance, neither has it made its appearance in our groves; these, together with a long list of destructive insect pests, have been intercepted and prevented from gaining an entrance through the vigilance exercised by our state and county quarantine officers. The added work in connection with the Mediterranean fruit fly and a realization of its havoc, if introduced into this State, have forced upon our attention the knowledge of several vulner-

able points in our horticultural statutes. Immediate attention must be given these points, in order to insure the fullest possible protection.

Every effort that promises protection against invasion is being put forth, every loophole is being closed and our quarantine strengthened wherever it seems possible. All this, together with the proposed strengthening of the weak spots in our laws, I believe, will make us equal to the immediate threatened danger.

Under present existing conditions practically our only hope of immunity from invasion lies in the efficiency of that particular division. Our greatest danger exists from the fact that the Mediterranean fruit fly is now firmly established in the Hawaiian Islands, and that as long as the pest is in the islands and accessible to every tourist, the danger of it being carried to California will continue to exist. The extra precautionary measures adopted, provide temporary relief only. In order to best furnish permanent protection, it is my opinion that if we are to obtain real protection we must control the source of infection. The logical conclusion to this line of thought naturally, is "Complete eradication of the pest in the islands."

At present, man is the dominant factor in the world, and under proper conditions, nothing is impossible, but in taking a practical view of the problem, from a standpoint of complete eradication, we are compelled to take into consideration the following opposing forces that materially retard our chances for successfully completing such an undertaking:

First—The peculiar habits of the species in question. (This species in the larvæ stage is marked by more than an average resistancy to insecticides.)

Second—The enormous area to be treated. (Six hundred square miles on the island of Oahu alone.)

Third—The character of the area. (Largely mountainous and inaccessible.)

Fourth—Wild host plants. (Thousands of acres of wild guavas, cactus, tomatoes, etc.)

Fifth—Peculiar climatic conditions. (Permitting of continuous uninterrupted breeding.)

Sixth—The cosmopolitan character of the population to deal with. (Fifteen distinct racial types and thirty mixtures of these types.)

Seventh—Absence of funds and adequate laws in the territory.

Of the foregoing obstacles to the complete eradication of the pest, the greatest one is the enormous area of the infested wild guavas. The extent of this growth is absolutely beyond the conception of any one who has not been in the islands. Practically all of the waste area is covered with plants of this species. Most of this land so covered is practically inaccessible, and the difficulties of fighting the insect on this ground are so great that a problem is presented that borders closely upon the impossible, even if sufficient funds were available, and the necessary legal measures adopted that would provide the authority to conduct such a campaign.

Basing the statement upon my observations and investigation and past experience, I would say that under existing local conditions in the islands, complete eradication is a practical impossibility. With complete eradication a practical impossibility, the question naturally arises, what is best to be done to minimize this danger, that is imposing new

and added duties to our quarantine officers, and which will undoubtedly tax their capacity to the utmost?

In attempting to solve this problem, my conclusions centered upon a system of control of the pest by artificial means, covering the center of our probable infection, which includes the city of Honolulu, to be followed by natural control through parasitic insects and predaceous in the higher uncultivated areas. A carefully outlined systematic campaign of clean culture, which not only includes the collecting and destroying of all infested fruit, but providing for the introduction of the natural insect enemies of this pest, was inaugurated and financed jointly by Hawaii and California, and has been in active operation since November 1st.

I will quote from a letter recently received from the gentleman who is in charge of this clean-up work, which will give you a slight idea of the extent of these operations:

"You would be surprised to find the number of fruits of all kinds, which are in bearing, and attacked, and yet this is not the real fruit season.

I am getting the majority of occupants to coöperate yet there are very many who will not realize what it means to strip their trees of fruit, and there are enough of these people, who hesitate and kick, to make it hard work.

I have destroyed tons upon tons of fruit since November 1st. I have the system well in hand, but will improve upon it as soon as the maps are finished."

I am largely guided in this matter by the belief that if we can reduce the infection in the islands 90 per cent, we will receive, proportionately, the same amount of protection against incursion.

Following one of my recommendations for added protection, the State Commissioner is sending an inspector to Honolulu, who will be given an honorary appointment by the territorial horticultural authorities, and whose duties will be to prevent fruit from being taken on to the dock or aboard vessels whose destination is California.

Arrangements are actively under way to bring about the necessary changes in our laws, through both the State and Federal governments. We have the hearty coöperation of the various ocean transportation companies, and the United States customs men, in enforcing the quarantine that has been placed on island fruit.

The present situation is indeed a trying one, and time alone will demonstrate the efficiency of the present system of protection that is being employed, and while being somewhat reluctant to render an immature decision regarding the same; from a just observation of the entire matter I am led to believe that we will be able to prevent the introduction of this most disgusting and destructive pest.

In conclusion, it would not be fair to leave this subject with the idea prevalent in your minds that if our system should not prove infallible, and the pest would gain admission to our State, that our entire orchard properties would revert to pasture lands and that our great industry would be absolutely wiped out. It would undoubtedly be a very serious blow to us, but I believe the loss for a time would not be so much in the nature of actual fruit, but rather loss of markets for the fruit not attacked, owing to the probable fact that, as soon as the fly was reported in California, the eastern states would immediately quarantine against fresh fruit from California. This, to my mind, is our greatest immediate danger from an introduction of the pest.

Our industry represents an enormous investment. The policies upon which it is founded will not submit to the "heretofore impossible" when it embraces a matter affecting its very foundation.

Again, this pest has never attempted to ruin the fruit industry of a country so well organized to combat it as we are, and as California leads the world in fighting insect pests and taming those "heretofore uncontrollable" insect devastators; and while it would be an added burden for a time, it is more than probable that this species might meet its "Waterloo" here. [Applause.]

THE CHAIRMAN. I think possibly we had better defer the discussion of this paper until we have the next, because they come so near together, and the discussion of one will overlap the other; so, with your permission, we will defer the discussion until we have the other paper. Is there any one who objects?

I want to congratulate this county again. I spoke some pretty good words of it yesterday; they were all merited. We wanted somebody to help us, and looked all over the country and finally lighted upon Mr. Bremner. We wanted somebody to go out to Hawaii, and we took another one of your citizens. So I have great pleasure in introducing one of your former citizens, and the Chief Deputy Quarantine Officer, Mr. O. E. Bremner.

QUARANTINE SERVICE OF THE STATE COMMISSION OF HORTICULTURE.

MR. O. E. BREMNER. The Anglo-Saxon in general, and our own American in particular, has within the past few years afforded the world the most convincig proofs of the efficacy of systematic scientific control of those forces which tend toward better health and a lower mortality, and while this subject of horticultural quarantine may not seem to relate directly to these things which control our health and vitality, it does deal with conditions which may decrease the efficiency of our labors, and thus produce a direct loss of those vital elements which go to make up the life of an agricultural people.

The State Board of Viticultural Commissioners was the first body of men provided by the laws of California for the purpose of promoting and protecting the products of our soil, and much of the success of California's fruit and vine industries must be attributed to the impetus given them by these pioneers.

The first legislative act for the protection of the industry did not occur until 1881, and was essentially a viticultural law, and came only as a culmination of circumstances which made some action on the part of the State imperative. The three or four steps in the depressing circumstances were in chronological order; first, the introduction of the greatest of all grapevine insect pests, the *Phylloxera*, in about the year 1860; next, the rapidly developing citrus industry of the south was almost totally destroyed by the cottony cushion scale, introduced in 1868. The cars of fruit shipped decreased from 8,000 to 600 in a single year. Then came the codling moth on our home fruits in 1875, followed very shortly after by the San Jose scale.

This viticultural law of 1881 provided for a chief executive viticultural officer whose duties were defined as follows: "To prevent the spread of vine diseases and vine pests by declaring and enforcing rules and regulations in the nature of quarantine," etc.

In section 8 of the same law provision was also made for an officer

"who shall be especially qualified, by practical experience in horticulture, for the duties of his office, to perform similar duties respecting the protection of fruit and fruit trees as are provided for in this act in reference to grapevines, with like powers." For the purpose of selecting the most competent man possible to fill this office, the Board of Viticultural Commissioners appointed a board of horticulture, who were asked to select a man for the position, with the result that Matthew Cook was recommended and duly appointed. A law creating the county boards of horticulture was also passed at this time, and this law, with surprisingly few modifications respecting the essential parts, is the law under which our county commissioners now act.

No quarantine regulations were instituted or work of this kind attempted until 1882, the first year being taken up with a description of the insects of California, together with the best remedies for the same. This volume contains the description of some 400 insects, and certainly reflects credit on its author, Matthew Cook.

The first State Fruit Growers' Convention met in Sacramento in 1881, the second in San Jose in 1882, and at this convention a committee was appointed to draft a bill for the protection of the horticultural interests of the State. This bill, which finally became a law in 1883, created the State Board of Horticulture, which remained in existence until 1903, when the present law became effective.

As a matter of record it might be of interest to note the various horticultural officers who held sway over the quarantine department from the time of Matthew Cook until our most esteemed friend, Alexander Craw took charge. At the first meeting of the Board of Horticulture on April 23, 1883, Dr. S. F. Chapin was appointed quarantine officer. Wm. Boggs succeeded Chapin on November 16, 1885; W. G. Klee was appointed June, 1886, and held office until about November, 1888, when by resolution the office was abolished; N. W. Motheral, appointed June 29, 1889, to position of entomologist (a new office) and resigned November 4, 1889; George Rice was appointed clerk of publishing and quarantine bureau (a new office) on June 29, 1889, and resigned July 1, 1890, when Alexander Craw was placed in charge. Honorable Elwood Cooper, who was for so many years president of the State Board of Horticulture, and the first commissioner of horticulture, in an article on the life of Alexander Craw shortly after his death in 1908, wrote as follows:

"On July 1, 1890, eighteen years ago, Mr. Craw was appointed by the State Board of Horticulture quarantine guardian, a position which he held for fourteen years, giving his greatest energy and conscientious effort to protect the fruit interests of California. The State owes much to his work. During this period there existed between us the most intimate relations. Our discussions of every problem that related to the quarantine duties, as well as the subject of parasitology, were always harmonious. We were of one mind in regard to keeping out the pests that threatened the State and in destroying those already here. In reviewing Mr. Craw's service to California it is difficult to measure its importance or to realize the value of such faithful work. Few men in any department possess such qualifications, and his work may well be recorded in the history of the State as an example of superior service."

It was really Alexander Craw who instituted the quarantine pro-

cedure which has developed into the present system of to-day. When he took up this work, the inspection and treatment of nursery stock and fruits in transit was not thought of in other states and foreign countries, and in view of the facts before us, it is surprising that such a condition could even exist up to the present day. Australia was the first country to copy our methods, then South Africa and Hawaii followed. Now Japan, Mexico and Chile are becoming much interested in this work, and will soon have similar restrictions against the introduction of, at least, fruit from other countries. The new Jewish colony at Haifa, Palestine, is practicing strict quarantine methods in the way of affidavits from nurserymen, signed by official inspectors and countersigned by their Turkish consuls, and without these no nursery stock can be shipped in that country.

The United States Department of Agriculture, through its Bureau of Entomology, has for many years not only advocated but fought for a national quarantine law in congress, but sad to relate, the National Nurserymen's Association has been more powerful with our national lawmakers than all the agricultural interests, and have defeated the bill every time.

The annual imports of nursery stock from all foreign countries amount to something like \$350,000, and the State of Massachusetts alone will spend \$1,250,000 in fighting the gipsy and brown-tail moths this year. Last year gipsy and brown-tail moth infestations were detected in over twenty different states on this incoming stock—California was one of them.

One of the most incomprehensible things to me is the fact that even now one bureau of the Department of Agriculture seems to be not only opposed to quarantine restrictions, but seeks to avoid such state regulations as ours, and, as a result, one of the most dangerous sources of insect and disease introduction is through this channel.

On June 12, 1908, our quarantine officers intercepted and destroyed a part of a shipment of several tons destined for a station in California, and on these trees and plants were found fifteen different species of insect pests, many of which could not even be identified by our best authorities at Washington, and during the past month a consignment of trees from Manila for Chico was forwarded on to Washington so as to carry it beyond our jurisdiction, and thereby escape destruction, and this on account of the presence of the dangerous citrus scale pest *Pulvinaria psidii*, concerning which the United States Bureau of Entomology makes special mention in their pamphlet on the National Quarantine law.

One other department of the United States Government, that of the Treasury, should be given special mention for the part it plays as a means of preventing the introduction of insects and disease. This is brought about by the thorough coöperation of the United States Customs Service with the Bureau of Entomology and our own department. It was mainly through the efforts of Alexander Craw that this coöperation action was established; first, by order from the chief of the bureau at Washington, and now through over twenty years of custom the practice is so well established that no customs official would think of releasing a plant, fruit, or seed without first obtaining our consent. In fact, I believe that they are really more diligent in their aid of our work

than in their own duties, and this is surely no reflection on the way they carry on their own work. They have, by being in constant touch with our work, come to realize the great importance of maintaining this branch of the horticultural business.

This coöperation on the part of the United States customs officials extends to all foreign mail, express packages, freight and personal baggage arriving at ports of entry in California, and simply means that nothing in the horticultural or agricultural line can enter California from a foreign country without passing through our hands. This, of course, does not include such shipments by the way of New York, New Orleans, and other similar ports of entry. We are, however, notified of all shipments by freight or express which are destined for California through these ports of entry through the courtesy of the Bureau of Entomology. It also means that we have at our disposal a force of over three hundred men, without whose aid we would have to maintain a probable force of fifty men to carry on the work in as efficient a manner as is now accomplished with four.

The theory of horticultural quarantine, if you could call it such, is that the most efficient method of fighting insect and disease foes to our horticultural and agricultural industries, is to prevent the initial introduction. There has never been a case on record where once an insect pest has been introduced and established in a section, that it has ever been eradicated. Such an infestation may possibly be kept below the danger point, but the menace is always present. Take, for instance, the cottony cushion scale; you will agree with me that the introduction of its natural enemy, *Novius* (*Vedalia*) *cardinalis*, has reduced it to a minimum, but you must also note that each year the State Insectary sends out thousands of these little beetles to clean up sporadic outbreaks, and should chance develop or introduce an equally efficient enemy on the *Vedalia*, we would either have to depend upon another means of control, or the cottony cushion scale would again overrun all our citrus orchards.

I have heard again and again the theory of adaptation foolishly applied to the quarantine work. This is what some say, and they even profess to be practical entomologists or men with sound horticultural judgment. Because this certain insect has never made its appearance in our State we have no means of ascertaining whether it would become a pest under our special conditions, and it is, therefore, unnecessary to try and prevent its introduction. And in spite of the history of the ravages of the Mediterranean fruit fly in all climes and conditions, I have heard this very argument applied to this most dangerous of all insect foes of fruit.

Another, and perhaps the most pernicious, argument of all which has ever been set forth in writing, and scientific literature at that, is that reports indicate that certain insects which we have sought to exclude have eluded the quarantine officials in the past, and are now firmly established in our State; the work of this division is therefore, proven of no avail and should accordingly be abolished. Can you conceive of a man, supposedly a friend of the industry, putting forth such an argument?

What are the real facts in connection with this work from the time of Alexander Craw, and how many pests have actually been introduced,

and with what results? And on the other hand, how many have been prevented by timely action from overrunning our State?

Going back again to the time of Matthew Cook, we find that his list includes practically every insect pest in California, with but few exceptions, and it has been proved beyond a doubt that nearly every case of a bad introduction can be traced directly to the almost criminal act of some of our own citizens—thoughtless, ignorant; yes, but nevertheless a crime against the industry.

Take two of the most striking examples—the white fly (*Aleyrodes citri*) and the chaff scale (*Parlatoria pergandii*): one introduced by special plant introduction, probably by mail from the East or South, and the other by means of a dozen oranges from the Holy Land by way of New York. It would have been impossible for either of these cases to have happened through a California port of entry, either by mail or a passenger's baggage, for, as I have pointed out, all such foreign articles are turned over to us for inspection. A national and interstate quarantine law would have undoubtedly prevented these and other similar invasions.

It really seems strange that we should be obliged to defend the basic principles of horticultural quarantine, yet this is the case, and one of the most foolish arguments, is seemingly the one most commonly advanced: Two men directly connected with the horticultural industry argued with me in this wise: We can not see why such stress should be laid on the danger of introducing this Mediterranean fruit fly, for in the first place we have no means of ascertaining how great the damage would really be to our fruit industry, and whether it would actually live here or not; and again, we know that fruit is produced in abundance in such countries as Spain and Western Australia, where this pest exists. Can you see the fallacy of such an argument? I believe I can. What constitutes an insect pest? One that destroys your entire crop every year?—half of your crop?—10 per cent of your crop? I certainly would draw the line as low as 10 per cent. How many 10 per cent decreases even in the value of your crop can you stand under present conditions? Ask the table grape growers.

Now, when it comes to the Mediterranean fruit fly, the damage will run from 50 to 98 per cent. One man from Honolulu told us while we were inspecting his baggage, that he had some peach trees in Honolulu, and that he estimated they held 1,000 peaches to a tree this year, and not over 10 to a tree were free from the maggots.

Did you ever hear of the olive fruit fly? They produce olive oil in Spain, yet it is a fact, and can be verified by men in this room, that some years this fly takes over 70 per cent of the entire olive crop of that country. Would you consider this a desirable immigrant?

Now, as to the Mediterranean fruit fly in Spain; you perhaps know that the entire crop of citrus fruits is picked green and ripened by processing for the trade on account of the ravages of this fly.

In Western Australia they produce no commercial stone fruit in the infested districts, but as that section of Australia alone is nearly eight times as large as the whole of California, they still do produce much fruit in many sections where the fly is not present. This has been made possible solely on account of the ironclad quarantine laws of that country, which absolutely prohibit the shipping of fruit from infested

regions to those which are not. The climatic conditions of Western Australia and California are almost identical, and it is simply criminal to suggest the idea of taking any risk on such shaky grounds as lack of congenial environments.

The largest Australian importer of California fruits, Mr. T. Duffy, was asked on the dock one day to make a statement regarding the probable introduction and effect of this fly to California. He said that the fly would absolutely destroy our peach and prune industries in a very short time, and would rapidly spread to our citrus and other fruits. Dr. Howard, chief of the United States Bureau of Entomology, when asked about this fly, said: "The liability of introduction is imminent, and the results would be disastrous. There can be no argument about it." Certainly nothing but the most perfect and strictly maintained quarantine service will prevent the introduction of this pest into California. The past history of this insect leads me to believe that just so long as the Hawaiian Islands remain above the water line, just so long will they have this pest, and no amount of eradication methods will warrant the relinquishing of our efforts in the prevention of its introduction.

But has this system of quarantine proven effective in keeping out specific pests? As one instance, let me cite the melon fruit fly (*Dacus cucurbitæ*). This insect has been known to exist in the Hawaiian Islands for some fourteen years at least. Its presence has caused great havoc to the cucurbits, such as squash, watermelons, cucumbers, and also attacks tomatoes and string beans. These vegetables are almost prohibitive in price, owing to the difficulties attending propagation, as they have to be raised under screens, glass, etc.—in some instances the attacked portions are cut off and burned as soon as detected. During the winter months, when these vegetables are particularly high in price here in California, they have made a practice of importing these products, with the result that the quarantine records will show many of these consignments destroyed on account of the maggot. Now, without a special quarantine up to about a year ago, and only the regular inspection work to be relied upon, we have prevented the introduction of this serious pest, which in form and habits somewhat resembles the Mediterranean fruit fly.

This is perhaps the most hopeful aspect of the whole situation, and particularly in regard to the last named insect, for if we can prevent the melon fly from being introduced for fourteen years, why not prevent the Mediterranean fly by the same general system, but with more stringent laws, a more perfect organization, more men and better informed citizens and traveling public.

Why is it necessary and what can be done to materially increase the efficiency of our quarantine service? First, law. Under the law as it stands to-day many of the acts of our quarantine officers are little better than piracy, and in a decision of the attorney general, rendered December 8, 1911, relative to the powers and authority delegated to the quarantine officers, he states that the law is meager in the authority which it gives the quarantine officers. If we simply carried out our present law to the letter, it would not give us proper protection against insect enemies that are now trying to invade our State.

There is now no way to punish violation of the law except by the

destruction or return of the fruit or plants in question, and this even is optional with the owner. A substantial fine applied to a few cases would stop the infractions now occurring. For instance, on one of the last boats from the Hawaiian Islands there were four boxes of pineapples in one private shipment. The pineapples in one of these boxes were so packed as to completely hide a paper sack of mangoes in the center of the box, and mangoes are one of the worst carriers of the Mediterranean fruit fly known. Solve this part of the problem by appealing to the legislature to at once pass a logical, valid, strong bill, giving the quarantine officers all the power necessary to become complete masters of the situation.

Next, men. The surveyor of the port uses from twenty to forty customs inspectors for the same work that we attempt with from two to six. On the one hand we are criticised for holding up the channels of trade and travel unnecessarily, and on the other with slighting our work if we perform it too rapidly or seek to transfer some of the burden of the inspection work to the county commissioners. It would be possible to use a force of at least eight or ten men expeditiously in this branch of the service. If there is not enough money in the treasury, let some other department of the State suffer; they most certainly will suffer if we allow the ruination of our fruit industry.

Then there should be more coöperation—better team work—between the county commissioners and the state quarantine department, and, for fear that I may trespass on other papers presented here, I will make only one or two suggestions on this subject. The county commissioners should make at least weekly statements to the state quarantine office during the importing season, refer immediately all suspicious cases of insects or disease, visit that office at least once a year and see exactly how the state officers handle the inspection work, and, above all, keep up a correspondence with them regarding all quarantine matters.

And now, Mr. Grower, why do you import nursery stock, fruit, etc.; and, Mrs. Grower, those roses and other ornamentals from foreign countries and other states? But if you must import, write to the quarantine officer and ask his advice as to what you intend ordering, and from whom and where you wish to order it. In fact, I should like to see this point incorporated in our state law, that growers and nurserymen should first have to gain the permission of the state horticultural quarantine officer before ordering foreign and interstate nursery stock or seed. Above all, Mr. Grower, we must insist on the principle of clean orchards and fruit ourselves, for if we cast not the beam from our own eye, how, then, can we consistently see to cast the mote from our brother's eye?

THE CHAIRMAN. Ladies and gentlemen, we will now have a discussion of these two papers. If I may just say a word: In Michigan I had to do with a fly which belongs to the same family as this one does, and it worked on the apple very much as this one does on nineteen or twenty fruits, and that fly, it seems to me, would be absolute destruction to the fruit if it were not that it causes the fruit to fall, and we clean it up and destroy it. You see, this is a terrible pest. We have another kindred pest in Mexico, the Mexican orange maggot, which works on the orange and other fruit, like the guava and mango, and surely this would be a great pest. It seems to me this is a matter of great importance.

Just consider that in the last year we have received \$75,000,000 for fruit. The gold production of California is a mere bagatelle compared to it. These gentlemen are prepared to answer any questions, or would anybody else like to make any remarks? The matter is open for discussion.

MR. BOWMAN. I would like to ask Mr. Bremner one or two questions in regard to this quarantine: If seedlings come from France to one of the inland counties, are they inspected before they reach their final destination by the Government or by California?

MR. BREMNER. Within the past year the Bureau of Entomology has gained the consent of the Custom House Department to notify them and have all such shipments inspected at New York by the United States Department of Entomology, and then they notify us of the arrival of these shipments. I do not believe the inspection at New York is very well carried on, for the reason that Dr. Howard has not the men available, and has no proper appropriation for the work. He notifies the State authorities that such shipments are on their way, and we in turn notify the county commissioners that these shipments are coming into their district. That is the means we are taking at the present time, and you will probably receive notice of all shipments coming into your county from now on.

MR. BOWMAN. I would like to ask, after they are inspected by the State or by the Government, is there any mark that we can distinguish? The reason I ask is that I have had those shipments come in, and I have found strange insects on them, and I was wondering if there was any distinguishing mark put on them?

MR. BREMNER. There are no distinguishing marks put on by the Government people, but we put one on, a little red tag, on anything that we pass. We always put those on—little red stickers placed on the box.

MR. PEASE (of San Bernardino County). In regard to that national quarantine matter, I wish to say that I have several times received in my county, notice that nurseries have made shipments of pear seedlings from France, and at one time I remember I was notified by Mr. Ehrhorn that there was a shipment coming, but I did not get the notice until after the pear seedlings had arrived and they had taken them out of the box and planted them. I will state that I inspected them after they were put in the ground and I found four nests of the brown-tail moth in those seedlings.

MR. GALLOWAY (of Sonoma County). I am satisfied that many numbers of the imported packages of nursery stock seedlings, as well as grafted grapevines are not inspected at all before they reach their destination; at least, there is no indication in examining the packages that they have ever been disturbed in any way. We have had carloads of French grafted vines come, and there is no indication that a nail has ever been removed, or that the package has ever been disturbed in any way. The same thing has happened with regard to seedlings. I am glad that came up, because I wanted to know whether the state quarantine officers inspected those imported packages. If they are inspected, there is no evidence whatever of it after a careful examination of the package. They do not appear to have had a nail removed or any sign that the package has been disturbed.

MR. BREMNER. I do not know what the orders were or the process they went through until I went into the office. We always notified the

commissioners by letter, telling the date, the number of packages, and the contents if we intended them to pass upon the plant inspection in detail—usually nursery stock or vines. There will be a carload come in at one time, consisting of five million vines. With a quarantine force of two men it was absolutely an impossibility to count those even in a year. What could we do? We opened a majority of the cases under certain marks and inspected them the best we could, spending two or three days in the work, and then we notified the county commissioners to make a detailed inspection of the contents. It would take a force of forty or fifty men to inspect the shipment in that way, and, of course, such shipments as seedling nursery stock have to be passed up to the county commissioners, but we in every case will notify you that they are coming in.

MR. BANKS (of Butte County). In my county I receive a great many bulbs that come from foreign countries. With the exception of one time, I have always been notified of their being on the road by the State Quarantine Commissioner in San Francisco. I do not know how long that one shipment lay in the depot before I was notified.

MR. CUNDIFF. I think the very able manner in which our chief quarantine officer has handled this subject leaves certainly nothing in the way of criticism, and the only recommendation I would make would be in regard to intending purchasers of nursery stock consulting the inspectors. That may be brought about by the influence of the county commissioners, if you educate the people in your own county as to the importance of that thing. In turn, the horticultural commissioner, as recommended by our quarantine officer, should be in close touch with our quarantine officer so that at all times they may be informed of several places to get different varieties of stock, and in turn be absolutely correct and have safe information to extend to intending purchasers. This is largely an educative proposition, and can be brought about largely through the county commissioners by impressing upon the people in their counties the importance of this very thing, and it certainly would have a very great influence.

MR. BLOOMER (of Sacramento). I think the state department is starting out in the right direction. Mr. Merrill, who is chief deputy, is known to have taken up this work of the nursery. He ought to get the names of the different nurseries and the sales agents, and I believe he is going to make an investigation of the nurseries outside of the State, and he will give us that information so that we will know which nurseries are infested and are doing the work properly, and we will have some definite information, and we do not have to pay for it by getting the experience first. I think we ought to hear a few words from Mr. Merrill, the chief deputy.

MR. MERRILL. I have not much to say on this subject at the present time. I think that most of the commissioners received a copy of the letter sent out by the state commissioner to the different nurseries, so far as we were able, and I also sent a letter to each one of the quarantine guardians, horticultural commissioners, asking them to report to me the names of all the nurseries in their counties, because we practically have no information on file at the capitol, and we want to get every nursery in the State on record, so that we will be able to give the people who are coming in every day good advice. I asked the county commissioners at this convention to present me with the list, and I presume a good many of you have your list with you. These lists that you will bring in will

be compared with what we have in our office, and if letters have not been sent, they will be sent very shortly. We want to treat all nurserymen alike and fairly.

MR. HICKMAN (of Monterey). This is a very important feature of this work. We take the refuse from all parts of Europe in the way of seedlings, and I know we can raise better pear seedlings and better cherry seedlings than we can import, and they are easily raised, and why do not our California nurserymen do this work. You have this suggestion for what it is worth. I can show you some samples which are far better than those Mr. Waters has imported.

THE CHAIRMAN. How about that, Mr. Roeding? Are we sending too much to France and other places for foreign material?

MR. ROEDING. I think that the nurserymen of the Pacific coast appreciate the advisability of attempting to grow their own seedlings; anyway, some of the nurserymen in Oregon and Washington are engaged quite extensively in growing apple and pear seedlings. There is no question in my mind that we can successfully grow seedlings, and I believe there are sections in this State where seedlings can be grown to advantage. There is only one problem we have to deal with, and that is the question of labor, and although my friend, Mr. Hickman, made the statement that these seedlings are very readily grown, and there is no reason why the nurserymen should not grow them, there are not many sections in California which would grow all kinds of seedlings. A climate like Monterey or the cooler sections of the State would undoubtedly be adapted to growing seedlings; but you take any of the interior valleys and it would be almost an impossibility to grow apple and pear seedlings successfully; either they would not make a good head, or they would make such a growth on account of the heat as to be too large to handle. I am in favor of growing seedlings as far as practical, and it means that many of the pests which probably will be introduced would be kept out if these seedlings could be grown at home. These things can not be done at once. Those men demand the trees and the nurserymen have to keep the stock.

MR. BOWMAN. I would like to ask the relative value of the Japanese and the French pear seedlings. Perhaps this is not a pertinent subject.

MR. ROEDING. I have never investigated that matter close enough to give a definite answer. I have never grown any Japanese seedlings, never used them, although some nurserymen have grown them.

THE CHAIRMAN. It bears upon quarantine. Perhaps we had better stop this discussion, as we have all we can do this forenoon, and there will be plenty of time this afternoon, and I think this matter and the national quarantine will come up this afternoon. Mr. Burbank has kindly consented to come and let us fire questions at him, so the first thing this afternoon will be Mr. Burbank. Let us come with our questions ready; let them be questions on producing varieties; let us have our questions ready to call up the information which he has in such great store.

Now it is my pleasure to introduce to you a gentleman whom you will all like to hear. We are all interested in that great Panama exposition, and of course it would not be fair to have a meeting in California that did not bring that thing to the front. I am sorry to say that Mr. Moore could not be with us, and we would regret it very much more

if it were not that Mr. Robert Newton Lynch is here, and he will take up both questions. Mr. Lynch, we will be very glad to give you whatever time you want.

MR. LYNCH. It seems rather a difficult task for one man to take up the two great questions of immediate interest in California and attempt to discuss them with such small ability as I have. I am sorry that President Moore is not here to do it. I am very glad for myself, because I have long coveted an opportunity to come in immediate contact with the fruit growers of this State.

My distinguished predecessor in office as president of the California Development Board was a gentleman who took a great interest in the horticultural development of this State, and there are several other gentlemen on the executive committee, notably Colonel Irish and General Chipman, whom you have doubtless heard, and who are experts on the subject.

The relation of the California Development Board to the agricultural interest is one that is very close, and one that should be cultivated by coöperation of the very closest kind. I am quite sure that there are a number of things which we can do for you as they have been done in the past, and I would like to assure you at this moment of the hearty sympathy and close coöperation in every way with all the proper features of your work. I listened with intense interest to the papers which have been read this morning, particularly this paper by Mr. Bremner on "State Quarantine," and I assure you that the Development Board, representing the interests of the State, will be glad to assist in any way in getting legislative action in that line.

Now, taking these two subjects together, I will address myself to my own only slightly, and instead of speaking of state development, I would like to talk to you about the problem of the International Exposition, because we have been engaged for a number of years in a wide campaign of publicity to secure the development of this State, and we have not always been discriminating; we have not always understood the effect of some of the great forces which have been put in motion. If one calmly sits down to study the statistics, things that have happened in this State in the last twenty years, and then looks forward to the possibilities of the immediate future, it certainly challenges the attention of all thoughtful men. Twenty years ago the State had 50 per cent of its population in the rural district. You would naturally suppose that people come to this State to go on the land; that is the point of greatest emphasis, that we might overcome the very unfortunate tendency that exists elsewhere to centralize in the cities, but the fact is that only 30 per cent of the inhabitants of the State are now in towns of 2,500 or under; that is to say, that we are suffering just as much from that tendency in California as anywhere else. I am free to say that if that tendency goes on, and if in the next ten or twenty years the same ratio shall prevail, we shall have in California a most tremendous problem. If we are not able to handle it beforehand, it will handle itself then by very arbitrary, violent and unfortunate means in order to rectify economic conditions.

By the holding of a great exposition we are looking forward to a great many benefits, and there undoubtedly will be such. The history of expositions, as a rule, has been to build up cities rather than the country. We are hoping that the Panama-Pacific Exposition will build

up the interior of the State instead of adding those to the cities who perhaps are not a real contribution to the building up of a great empire such as we are attempting. So I would like to speak of the problem of California development.

I am not at all pessimistic on the subject; in fact, I am profoundly optimistic. I shall call attention to the great forces which will make the development in the next four or five years very remarkable—things which I will call to your attention that will occur to us all. There are some great influences that are conspiring together to make a tremendous change in California. There was a period which Benjamin Ide Wheeler emphasized in an article in the *Outlook*, which was very broad in its intelligence and its comprehensive scope. President Wheeler called attention to the fact that there was a period in California when there was very little development. There was only one railroad trickling in here; and afterwards we commenced to make a commonwealth with our own habits and customs, and with many unfortunate tendencies connected therewith; and then suddenly there came a period of great excitement. This particular section of the State stagnated for a long time, but all sections woke up. In the last ten years we have added a hundred thousand people to the State. The southern part of the State received the largest part of that growth, where the land is most intensely cultivated. If you make a study of the statistics in California by sections you will be surprised. The growth of Los Angeles is not due entirely to an advertising campaign. There is a great proportion of the products of the State produced south of the Tehachapi. There were 900,000 people added to our population in the last ten years, and there probably will be more in the next ten years.

These forces to which I desire to call your attention are, in the first place, the great emphasis on western immigration. The West has the attention of the world. The great emphasis at the present time is on the West. It manifests itself on all kinds of institutions, like land shows; and those of us who have come in close contact with the land shows know that three quarters of the exhibits, and all the lure of the land comes from the south, notwithstanding that the south is not to be discussed with its great undeveloped reaches of land. But the West has the call, the fascination, the lure; the West is drawing the people; and this great Western emphasis is being encouraged in almost every direction. It is meeting with a great deal of sympathy and attention, and it is generally noted in every direction.

The State of California itself, quite alive to the advantage of drawing desirable people from various sections, has adopted an advertising campaign that means the expenditure of a million or a million and a half of dollars every year to bring people into the State, advertising the resources of the State. Possibly every town and hamlet of the State has been organized with a chamber of commerce, which has only one object, to add population to the various districts and towns. Some of these organizations raise large sums of money and expend them. They are organized into various district bodies, like the Sacramento Valley Association. They make exhibits throughout the East, and publish a tremendous amount of literature, and they are encouraged by various railroads and public bodies and stimulated into great advertising activity.

A mere comparison between the amount of money we are spending

upon advertising with that spent by other states would surprise you as to the great and tremendous activity of this State. I was asked by Governor Merrill of Iowa some time ago as to whether I thought \$100,000 appropriated by the legislature would be sufficient to start a campaign that would stop the emigration from Iowa to the extent that they had lost population, the only state in the Union that had that difficulty; and I called his attention to a few organizations that were spending more money than that, and he was quite surprised at the amount of money that could be spent that way.

We have to call upon the public attention, and it is a tremendous force that is working, and any one that can find any opportunity or inducement to come is going to come. There is no difficulty in getting people to come to California if you give them any assurance that it will be all right when they come. Very unfortunately that advertising has impressed people that conditions exist here that do not exist. They have come, expecting an easy life and something different, and have not come with that energy and capital that would obtain elsewhere. However, this is a tremendous influence, and it is working every day.

Now, the opening of the Panama Canal is going to revolutionize affairs on the coast. There is quite a little dispute as to what the effect of the opening of that great waterway will be. It is thought that it will revolutionize manufacturing and industrial conditions. It is presumed by some that it will solve many of our problems, and maybe bring many others with the solution. But every one has agreed that the opening of that canal is going to revolutionize conditions. The easy access by water of San Francisco to the other harbors of the world will make them entirely different from what they are at present; and there are tremendous harbor improvements going on in order to prepare for the great traffic that is expected to come to the harbors of the coast; and the opening of the canal, whatever effect it will have, is attracting the attention of the world to the Pacific coast.

President Taft assisted; in fact, he was almost instrumental in getting the exposition to San Francisco; and he based his ideas upon many sound reasons from his standpoint, and he was kind enough to say of San Francisco that the Pacific coast was more profoundly affected by the building of the canal than any other portion of the earth's surface, that it profoundly affected conditions in California, and San Francisco Bay deserved to have the exposition, and that was one of the reasons for giving his weighty influence towards the securing of the Panama Exposition for the Pacific coast.

Now, the opening of the canal will direct the attention of the world to what they all concede to be a new territory. We are at the front door of the Orient. We now sustain a new world relation, and this is attracting evidently and undoubtedly the attention of the world, and will bring a great many people to us.

Then, there is the question of European emigration. We were rather startled to discover that, notwithstanding the fact that that subject was probably the most vital thing for the attention of California people, no adequate machinery existed to study the problem. We have a State Labor Commissioner, but we have no adequate immigration machinery. The California Development Board woke up to that situation and established a bureau for the investigation of the subject. We thought we

ought to know what might be the possibilities and probabilities of immigration through the Panama Canal directly from Europe, and to that end the bureau was established to make a scientific investigation. The literature upon the subject of immigration with its many problems was examined, and experts were engaged by letter, and all of the information that could be secured upon the general problem was gone into. Our organization went into the problem of investigating the foreigner in California as to his adaptability, his availability and desirability—as to his adaptability in the matter of labor; and many lines of that investigation touch very closely the interests of you gentlemen who are met in the fruit growers' convention. Then, foreign consuls were interrogated, and our own United States consular service abroad was utilized.

Finally, about six months ago I made a trip to Europe in the interest of the State, being appointed to particularly care for the California exhibits at the Turin Exposition, and then to make a trip through Europe and investigate from personal observation the amount of interest in Europe and the possibilities and probabilities based upon the material we would gather. The results of that investigation were somewhat interesting. I was somewhat pessimistic in the beginning as to the possibility of having any influence upon the great stream of emigration. I am only too sensible of the fact that the old governments have put into play their whole legislative power to restrict people from leaving them. It is a fact that we are drawing the great bulk of our immigration from countries that are making a most desperate and frantic effort to stop it by all kinds of legislative enactments. I am only too sensible that those people will have great difficulty unless they pass absolute restriction laws.

The question of whether we might influence immigration to the Pacific coast was one on which in the beginning I was very pessimistic, but as I investigated the subject I became more and more optimistic, believing that there exists a series of circumstances which might enable California to perform the miracle of choosing some of its foreign population instead of having that population choose it. That is the policy of every country that wants population, the policy of Canada, and the policy of the Argentine Republic. The greater distance, even through the canal, that San Francisco bears to Europe over the Atlantic ports; the higher rate of transportation which must of course prevail, though it will not be so very much greater, as some people may suppose; the competition for labor on the part of places like Argentina, and the fact that the people who select California must have some intelligence, and the fact that we may get over the heads of those who have intelligence to come—those who will venture themselves into a country as far off as California—gives us some hope that we might influence that stream to get the desirable element and keep back the undesirable element that might seek our shore.

I have the opinion of Edward L. Steinhart, who is perhaps one of the greatest experts, and with a practical knowledge himself—originally an immigrant, going back to Europe several times and starting with emigrants landing in America; Mr. Steinhart writes me that California will be affected by European emigration to the precise extent that she places her resources before the attention of people she desires, in Europe, which is a very favorable opinion from our standpoint.

The steamship officials, many of whom I have interviewed both in New York and Europe, and their various agents that have come to San Francisco to investigate the question, are not quite as optimistic as others I have talked to in regard to the number that will come at first. But be that as it may, we are going sooner or later to have a tremendous emigration from Europe directly to the port of San Francisco, and that is going to have its profound effect upon California development.

Now, last but not least, we have the great Panama Exposition to attract the attention of the world. This exposition is financed beyond that of any other exposition ever held; it is located in the midst of a climate that is more favorable than that of any other exposition; it is administered by men of probably as great capacity as any other exposition had at its head. It promises to become the world's most unique and greatest exposition. And while there has been some amount of criticism of the directors due to the fact that the public has not been taken into its confidence in every detail at this preliminary stage, yet the directors of the Panama-Pacific Exposition are laying their foundation broad and deep, for the building of an exposition that will challenge the admiration and attention of the world.

They have not spent two million dollars in wining and dining, as was suggested by some critics in San Francisco some time ago. They have not spent a five-cent piece in a banquet. The officers of the exposition have frequently attended banquets and, whenever they have attended, they have paid their way; the officials have never drawn a dollar for services. The gentlemen who went to Washington to secure the exposition paid their own expenses. It seems somewhat cruel and ungrateful that the public at large should be so ready to jump upon a lot of men who are giving their time and their ability to a matter of public concern, and to the building of what is going to be the pride of California and of the West—that the public is so ready to criticise every detail and demand to be immediately informed of a great many things which, in the nature of the case, can not be communicated until they get into some sort of shape in regard to the building of this exposition. I can quite assure you from my own knowledge and acquaintance with the gentlemen who are conducting the exposition, that they are fully alive to the tremendous responsibility and the great public trust that has been given to them in connection with this exposition.

Now, the exposition is not a mere advertising scheme. President Moore rebuked a speaker in San Francisco at the banquet that was held by the Chamber of Commerce the other night, who dwelt entirely upon the advertising value of the exposition; and he took the high ground that the exposition should never be referred to in that respect; that we did not care to tell the world that we were merely interested in having the exposition attract the attention of the world. If we brought the attention of the world to us that was a bonus. But we were trustees for the entire nation; we were engaged in conducting an exposition out here at our own cost, perhaps, but we were doing so in order to guard the prestige of the United States. No exposition has borne such an intimate relation to the United States Government as this one. Other expositions that have occurred in the past had some vogue; but this exposition commemorates and is inexorably lined up with the honor and glory of all the United States, who have been building a great

waterway, a waterway that has been the dream of almost a century, to unite the Atlantic and the Pacific. I was running through some old books recently; I got hold of an old book published before 1880 and another published in 1882, and as I read some of the things in those books it was remarkable how prophetic they were in speaking of some of the things that have happened—that the Panama region should be so constructed that ships could pass through. That book published in 1882 corroborates what Commissioner Cook said a few moments ago, that the time will come when the mineral wealth of California will almost be forgotten in the great horticultural development of this State, that this State had the possibility of growing that which would be the luxury and adornment of life—almost prophetic.

Now, the United States has constructed the canal, and the celebration of that great event will be in San Francisco; and the directors of the Panama-Pacific Exposition are fully alive to the tremendous work that is before them. If they should construct a building to-day they might have to tear it down, because the thing must be built as a unit; and it is a tremendous task and a task that deserves the loyal support of every one in the State, which I am sure you intelligent gentlemen are giving to it.

Now, all of these forces, the western emphasis, the coming of the immigrant to California, the opening of the Panama Canal, and the holding of a great, world-wide exposition, are of the utmost interest to the world. In Europe I had the privilege of spreading the news for the first time. At the Turin Exposition I was representing California, and was able to give out information as to the amount of money which was to be invested in this great enterprise, and had a model of the Panama Canal with the ships passing through it, and the relation of San Francisco to it, and distributed a great amount of literature. I placed that exhibit, which consisted almost entirely of fruit—and it astounded the Europeans, for they have not the facilities for preserving fruit that we have; it created a great sensation. I was interested in seeing the Italians; they would make all sorts of remarks. They said of some of the dried fruit that it was wax, that there was not any such thing. That great exhibit has gone up to Berlin and is located in the Equitable building, in the office of the California Board at present in Berlin, and there is being seen by a great many people. A wide European propaganda is already taking place, and the attention of the people is being aroused by the significance of this great event. There is a fascination about California itself which obtains in Europe.

All of these things combined create great emphasis on California, and it is going to mean development—that is, it is going to be an increase; whether it will be beneficial or not is entirely a question as to whether we will meet it. It is altogether cruel to ask a man to come out to California with a glittering generality, and when he comes there is nobody to tell him what to do, and he perhaps loses his little money in some enterprise to which he is not adapted and to which somebody has lured him.

We are going to bring over our exhibit from Berlin to Holland next spring, but I would not go to Holland and try to persuade those people to come to California without knowing if the Hollanders were adaptable. There was a colony of Hollanders that went down into Merced

County and it brought a curse upon that district. They dissipated their funds, and the reputation in Holland of California is not of a very stable character to-day. If we go to any place we must know what we want the people for. The California Development Board desires to coöperate very closely with the fruit growers of this State in getting the proper information. We want to know to the very last detail what you want; we want to know what you want in the way of labor; we want to know something of the value of real estate; we do not care ever to have anything to do with the sale of any particular piece of real estate, but we want to know the true conditions. We would not want to have a man try to grow fruit in a section of California where fruit can not be grown to advantage. You gentlemen can tell us all this; you can assist us. We can help you solve your problems in the way of labor and otherwise; and we desire the most intelligent and close coöperation between yourselves and us, so that in the formation of what will doubtless be the work of greatest emphasis on the part of our organizations, and, I am sure, the commercial organizations in the future—the work of distributing and taking care of immigration. And if that work can be carried out and satisfactorily financed and assisted by all public men and organizations, we may be able to direct the future population of California, and produce conditions in California where life may be worth living in the best sense.

Before concluding I would like to call your attention to a very important meeting, which I think that every one of you, who possibly can, should attend. There will be a meeting in Los Angeles of all of the commercial organizations of the State to study over these great problems which I have indicated to you. We are going to meet January 12th or 13th under the auspices and hospitality of the Los Angeles Chamber of Commerce. This meeting will consider in three different sessions; first, California's preparation for the opening of the canal and what are the things that California ought to do before the canal is opened. That is a live question, and it ought to be considered by the state-wide interests of all counties. That question, I believe, will be opened up by the president of the canal commission, and if he leaves the canal zone in time, he will undoubtedly be present; otherwise the Government will send another representative. We will have the benefit of other interesting speakers, and a symposium from various sections of the State. The first session will be devoted to "The preparation of the State; preparation of the various counties." The afternoon's session will be "California's preparation for the immigrant": What ought we to do; how ought we to prepare ourselves; what knowledge should we have; what machinery should be devised to handle the immigrant when he comes to California. Then the next session will be "California's preparation for the Panama-Pacific Exposition." You are very vitally interested in that. The fruit growers are going to be the people who are going to exhibit the things. We invite you down to that conference. It is going to be a conference of a very great extent. No less than four special trains have been programmed from this section of the State to go down. The Santa Clara people are going down in a train. We have a train leaving San Francisco on the morning of the 11th, with one fare for the round-trip—\$14. Your reservations should be made early in order to be on that train. San Francisco is going to be represented by a delega-

tion of the Chamber of Commerce of San Francisco, the Flying Legion and the directors of the Panama-Pacific Exposition and the directors of the California Development Board—the biggest and largest men in San Francisco are all going down. They desire to come in close touch with the other organizations of the State. Mr. Brown has charge of this district, and I believe a whole train is going from this district. There will be several hundred delegates, and I would like to invite this meeting to name five delegates, whom we would be very glad to give credentials to come with us and discuss the great problems that are of vital interest to the State.

I am very glad to be with you and to bring to you the greetings of the California Development Board and the directors of the Panama-Pacific Exposition. [Applause.]

MR. WILSON. I would like to say one word about Merced County. Mr. Lynch spoke about some Hollanders that came to our county. There were a few Hollanders brought there a few years ago; they were brought there by their own countrymen and located there on the land through them. All those men were sent there by their people. They were worthless at home and they wanted to get rid of them. They kept the road hot going into Merced buying liquor. They were all drunkards except three or four, and of course they could not succeed. But after they left, there were men that took their places and took that land, and that land is paying interest on a thousand dollars an acre. In Merced County to-day we have some of the finest land under the sun. Of course, we have land that is spotted, the same as any other counties, but, take it as a whole, Merced County is one of the finest counties of the State. Within the last two months a great many men from Sonoma County have gone down there and bought land, which, Mr. Galloway will bear me out, they claim is the cheapest and best land in California.

MR. LYNCH. I did not mean that as a reflection on Merced County as such. The facts are that the people who took the people from Holland there were not the best people. The way in which the matter was explained to me was that the Hollanders were not adaptable for these lands to which they were sent. Of course, if that land was worth a thousand dollars an acre, the Hollanders were not used to those conditions. I did not know of the minor details. Merced County has, of course, received a tremendous development.

MR. WILSON. Their coming there had a tendency to hurt the county, but we have outgrown all that.

THE CHAIRMAN. Every county in California has got just such men as Mr. Wilson. We all believe our own county is the best. I believe we can get a hundred people to say that there is no county like Sonoma. [Applause.]

MR. LYNCH. You recognize that the point I make has a good deal to it. There have been colonization schemes in this State where people have been misled and, where they have been misled, it brings a great difficulty.

THE CHAIRMAN. I am sure we have been much interested in this address. Now, we have a little time to discuss. We do not need to adjourn for six or seven minutes.

MR. MERRILL. We, of the state commission, are with you body and soul, and we have already laid plans to get out publications on the dif-

ferent fruits of California. We aim to make these practical in their nature and complete, specially adapted for people coming into the State. They will be prepared as soon as we can get the facts together. We shall visit the different fruit-growing regions and get our facts in regard to the different lines of work. We will try to put the proposition before the people in such a manner that they can understand it and gain something from it.

There being no further discussion desired, an adjournment was taken.

AFTERNOON SESSION—SECOND DAY.

THE CHAIRMAN. Mr. George Dutton will give an exhibition of his dynamite, as you know, but he says there is something better than that, and that is in the Elite Theater on Fourth street, two blocks from here. He says that will be really worth your while, and it will be at four and seven o'clock. And you will remember that Mr. Lynch suggested that we appoint a committee in regard to this matter of California development, and the matter of the great exposition. Now, we are all seemingly alive to that thing. We want that to be one of the marvelous successes of the world. It seems to me that is a matter of sufficient importance to have a special committee. It ought to be in the hands of good, careful people who will give it their earnest consideration, and I would like to entertain a motion to have a committee of three appointed, and to put that matter in the hands of that committee. If we could have a committee from this meeting that will go south, it seems to me that is a fine opportunity to get acquainted with our great men and a great opportunity to boost. So it seems to me that is worth while, and if anybody thinks so besides me, will you please make a motion to that effect—that two or three be appointed to take that matter in charge before the meeting is formally opened.

MR. BEERS. I move a committee be appointed by the Chair to take this matter in charge.

MR. GARDEN. I second the motion.

THE CHAIRMAN. You have all heard the motion. All in favor will please say "aye. Contrary, "no." The motion prevails, and I will appoint that committee later.

THE CHAIRMAN. Mr. Burbank is present, and, after the music, we will hear from him. We are very grateful to these good people for these decorations and all the pains that have been taken to make this meeting a success—we are very grateful to the people of Santa Rosa.

(A short intermission was here devoted to listening to a musical entertainment.)

THE CHAIRMAN. We have all read in the papers about the Wizard of the North, and the Wizard of Santa Rosa. I do not like the word; I never liked the word. It seems to me Mr. Burbank is worthy of a better name than that. I should say "genius"—a man who has raised millions of plants; and I feel like taking off my hat to the man that has that patience, that endurance, that persistence, that keeps right to the front and does such marvelous things. He has kindly consented to come here and answer any questions you may put to him.

Mr. Burbank, if you will kindly step forward we will be very grateful. [Applause.] It is a great privilege, I assure you to introduce Mr. Luther Burbank. [Applause.]

MR. BURBANK. I do not like that name, "wizard," either. Now, if you will please prompt me I will do the best I can to answer questions. I like to answer questions because then I know what you want to know, and I will tell you all I know. I will say "I do not know" if I do not, generally.

THE CHAIRMAN. The first question, please.

MR. GARDEN (of San Joaquin). Mr. Burbank, in your experience with your spineless cactus up to the present time, have you had any experience with the cacti where, under certain circumstances and conditions, they have gone back to their original condition?

MR. BURBANK. A few varieties that I call half-finished varieties, that is, they show a few small spines, under very unusual desert conditions, sometimes throw out a few spines at the bottom; but in ordinary, well-bred cactus, like some twenty varieties I have, they never, under any circumstances, have thrown out any spines in any location anywhere. I would just as soon think of the Baldwin apple or the Bartlett pear or any other individual variety—that is, grafted individual, not from seed—running back, as I would a cactus; and I find that they do not run back. Of course, you know there is a variation in all those fruit trees and all plants. Sometimes, for instance, a well-cultivated Bartlett pear, but very rarely, will send out a branch with a few spurs on it, sharp spurs. There are quite a number of Japan plums that do that; but any cactus that is well bred, and the individual variety, does not show spines or stickles on the leaves; they do not in nature any more than the Baldwin apple or Bartlett pear, or any other fruit. The forage varieties bear very little fruit, and I think it is very good that they do not. They give their strength to growth of leaves or branches—they are not true leaves. A good many people have thought when they see the true leaves, little things that look like spines, that they were soft spines. They are not spines at all; they are true leaves. There are a good many trees—some acacias—come up with one kind of leaves and change to another kind. Evidently they have been stranded in some dry climate and they have had to drop their spine leaves. They are really the stems, the leaf stocks that they use for a leaf, for without question they were stranded somewhere where it was too dry for them. The cactus is the same way. There is not a shadow of doubt that the cactus had leaves like other plants. These little leaves you see on the young cactus are rudimentary leaves; they drop off in a short time; but a great many people have written me that they were all covered with spines. A good spineless cactus does not run back in that way under any circumstances.

MR. GARDEN. In the propagation, after you have the spineless cactus established, in planting in the plantations, are there any particular portions of the plant that are better adapted to replant than others?

MR. BURBANK. In Europe, where they have grown the cactus for years—a hundred years, two or three hundred years, probably, and maybe more than that—they all originally came from America—if they want to raise a large quantity of fruit, they have an idea that if they

select those leaves that bear fruit, they will have that tendency to bear fruit; and there is a good deal of truth in that. If a leaf is taken that is young and not fully grown, I have certainly observed in my place, it does not bear fruit as rapidly and quickly as some of the older leaves; in fact, if some of the older leaves are set out in the ground they have twenty or twenty-five fruit the first year; but the fruit never gets to perfection until the plant gets older.

MR. GARDEN. How does the food value of the various cacti compare with the green corn food product?

MR. BURBANK. The average cactus, by analysis, is about equal to green corn fodder under ordinary conditions. There are some varieties more nutritious than others by analysis, and there are certain classes that are more nutritious. In different seasons of the year there is a slight difference. The better cacti average about like the best grasses or green corn fodder.

MR. GARDEN. Can you give us some idea as to the cost of production?

MR. BURBANK. Of course, a cactus—you can produce it—well, on my place I will produce it at 75 cents a ton, so you can estimate the cost that way. There are a good many places it does not grow as well. I do not know positively whether my land is better suited to them at Los Banos and the San Joaquin Valley than other places. It sometimes makes double the growth that I have on my places, but as often they make half the growth. It is a plant that will grow anywhere. I have one in my place that has been hung up on a tree and on a fence without a particle of water. I exhibited one here in Santa Rosa in a floral festival, and it has stood up for five years and is growing yet; it is sending out new leaves now. So that shows how it will hold on. You can take one of those cactus leaves in the spring, and put it in your overcoat pocket, and in the fall it will be rooted—every time. Take the same leaf at this time of the year and put it in the ground and it will be about certain to rot. It is peculiar in that way. You have to propagate them altogether in the hot months. In some of the warmer valleys, down towards Fresno, they propagate them in winter, put in a warm, sandy place; but just as sure as you take and plant them out as a fruit tree in the fall, they rot. If you put them one third underground in the pure, coarse, dry sand in the spring, every one of them, without an exception, would root and root abundantly, and just as vigorously as you can ask, never with a drop of water. We are careful with other plants standing alongside of them and have to board them up to keep the water from touching them, even in the hot July sun on the south side of a building. We always think of a cactus as a kind of rattlesnake, but if you get a rattlesnake that does not bite and at the same time produces something that will sell for what cactus does, you would value it. Even the fruit I sell in town. The men when they are idle pick cactus fruit. First, I had to run after the grocerymen to take this fruit; now they are sending wagons to us for it. People get a wrong impression from the taste of the fruit. If fruit is tasted without the idea of eating it your stomach rebels, but if you take the fruit for the satisfaction of eating it, it tastes very different. When the ends of the cactus fruit are cut off the skin peels right off. If you then take the fruit and sprinkle a little sugar on it—and if you put a little cream on it, it does

not harm—I do not think you would want strawberries. I think Mr. Roeding will bear me out in this. I have more than a thousand somewhat distinct varieties, and there are certain classes; there is the white-fruited ones and the orange-colored fruited ones and the purple-fruited ones and other colors. Some of the hybrids bear some white and some spotted on the same plant, and the flavors are as distinct as peaches or plums. You will find almost every flavor, except that there is very little acid. The cactus fruit contains by analysis more magnesia and soda and lime and potash in a digestible form than any other fruit in existence; and those are very necessary salts for the digestion. When the United States Government undertook to feed cactus and study the effect on the cattle, how much good it did them and how much they increased in weight and value, they found that the cactus, by its analysis, always produced far better results than any other feed of the same analysis, or of the same food value. It took them some little time to work that out. At least they found that these digestive salts, chemical salts, had aided the cattle in the digestion of the food that was otherwise indigestible.

MR. WEEKS. How does this cactus thrive in a climate similar to the upper Sacramento Valley, where it is intensely hot in the summer, and at times it drops 24 below zero in the winter time, with abundant rain in the winter time?

MR. BURBANK. You could not have a better climate for it. It would stand very readily down to 14 degrees. There is a great difference in the different varieties, but 14 degrees has never injured any except the very tenderest leaves; it has never injured well-grown leaves in the least. Some of them have never shown a sign of frost. In a rainy climate like that of Florida they do not stand as well as in a drier climate; the leaves decay in the winter slightly where the frost catches them. Here, if you tip the leaves with frost there comes a dry north wind and it heals right up; but if there come two or three weeks of rain, the smaller leaves decay a little. As to the summer heat: They grow first rate in Santa Rosa, and they grow first rate where it is very hot. Some places along the coast they do not grow so fast. They like a very warm and very dry climate summer and winter.

MR. GARDEN. In preparing the ground for planting, do you cultivate it?

MR. BURBANK. Almost as much as for many other plants, but they will live without any cultivation whatever, and produce an abundance of fruit; yet for forage purposes they produce a great deal greater quantity if cultivated until they get root; after they get root there is no chance for cultivation, and there is no necessity for cultivation. We simply mow off the weeds where we can get in next to them; we never cultivate them. We tried the experiment of irrigation on half of a patch, the other half not being irrigated, and it did not affect them a little. Of course, there is a climate and soil where if they are irrigated once in the summer it might do, but it would not take more than a particle usually used in irrigation; it goes on with its digestive process, making feed for cattle and food for people. This fruit—if you do not know much about it—after you have eaten it awhile, you know a good deal about it. The people who have eaten it always prefer cactus—they are crazy for cactus. We eat it at the table every day two or three times a day. Professor Ely Stanley of the Grecian University of Corinth,

Greece, was out here and he said that he considered it as nutritious as beefsteak for breakfast; he said he would prefer a half a dozen cacti to a good beefsteak. For the poorer classes it was their common breakfast. He said they used to commonly send out to get the spiney ones and rub the spines off, and if they are near the sea they put them in the sea so that they would get cool. They are like a warm watermelon when they are warm, and they are much better when they are cold.

There is a great variety of cacti, some carry as much as 16 per cent of sugar. They vary a little, and they are sweeter inland; but 6 per cent is a good average in the fruit. There is no sugar in the leaf.

I am just now in correspondence with a great paint company in Milwaukee. They expect to make a paint out of the mucilage that comes out of the leaves. You can take one of those cactus leaves and it will make a very brilliant whitewash by mixing with the lime and water, the mucilage that comes out of it. With an ordinary cactus leaf you can get perhaps fifty times its weight of pretty good mucilage—rather thin; you can not get it very thick; and that mucilage would no doubt be good in paint. It makes a whitewash that is very brilliant and very enduring; and one leaf would furnish enough mucilage for probably a square rod of whitewash. There is a gum in some of the varieties that exudes where the leaf is bruised. I do not know anything about it. I am going to have it examined. It will not dissolve in water; it will swell; but I presume alcohol or something will dissolve it. That shows why this resists the weather so well. If you take one of those leaves, a single leaf, you can get ten gallons of good material for whitewash.

MR. ASHLEY (of Stockton). In the use of cactus for forage, how close down do you cut it?

MR. BURBANK. The best way is to cut off the last six or eight weeks' growth. Most of the varieties make two or three sets of leaves in the summer, once in six or eight weeks. You cut off the upper part of the leaves, but if you cut off the second, it is all right. It is the same as the fruit tree: If you cut off too much it takes a great deal longer in reproducing; in cutting off the tree too severely, it would injure it for a while.

MR. DOUGLAS (of Contra Costa). In the absence of other food, would range cattle do well on cactus through the winter?

MR. BURBANK. Not unless they have some dry material with it. It is not a complete food. It is like corn fodder; cattle are found to do the best with it with a little oil meal or a little straw or something of that sort. The oil meal is very good; it supplements the cactus feed splendidly. It is very convenient in growing it where people have alfalfa patches and then have not enough water to supply the alfalfa patch. The cactus supplements the alfalfa, and if we have a dry year here, as they do in Australia every once in a while, cactus will find its place then. The only way to educate people is to compel them to see it. In Australia they have droughts once in every three to seven years; and though they furnish the best wool, the loss from sheep has been so terrible every once in a while that they are all discouraged about sheep raising. There is a wild cactus there. Dr. Jordan says some fool introduced the worst cactus that was growing in America. It is all covered with thorns. That has spread widely. They offered one pound six shillings an acre for clearing it, and some Yankees got hold of it, and

they cleared the land and got the one pound six shillings, and they made some alcohol and paper stock out of the cactus and made money out of it; and they are doing it now.

MR. PEASE. Under favorable circumstances how much fodder would you get off of an acre?

MR. BURBANK. That is one of the most difficult questions to answer—the same as grapes or any other fruit; it varies with the soil, not at all with the climate—that is, with the season. I do not think the season makes any difference; but I sold 46,000 pounds at one time of a northerly variety off of less than an eighth of an acre. It had been standing two years. I have taken off at the rate of 196,000 pounds of food to the acre from those same plants. All of them did not bear. There were several varieties. I think fifty tons of gross weight, the whole plant, in the second or third year with good agricultural land would be about an average. I think 100 tons—and there are others who have measured and weighed it—would not be out of the way the second year on some soils and some plants; but I think fifty tons would be a good average for good varieties.

MR. ROEDING. In the course of your remarks I notice that you called upon me or said that I could confirm some of your statements in reference to the edible quality of your cactus fruit. I did not know—and I was rather surprised, I must admit—that you would call upon a nurseryman, particularly one that has a reputation that I have among this body of men, to confirm the quality of the fruit which you, from your own statements, say is a very fine fruit. But regardless of the fact whether my statements would have any effect upon this body of men and ladies, I want to say that I had the pleasure of sampling some of your cactus fruit, both last night and this morning and between, and I am willing to admit, although I have had the pleasure of sampling the fruit on other occasions, that the addition of sugar and cream makes it a very palatable dish for breakfast, lunch or supper.

All of the remarks from you have had reference to cactus, and we all get the impression that is the only thing you have done in the plant growth. I think all the fruit growers are aware that there are many other things you have originated that have been of great value to the fruit-growing world, and among them are the plums. Now, I want to ask you whether there is any possibility of your improving such varieties as Cisco, Pomona and other types, to bring up the condition that those plums would not have seeds: in other words, make them stoneless?

MR. BURBANK. I referred to Mr. Roeding as to this cactus because I thought there were some people here who did not know him [laughter].

I think it would be a very long road to try to get peaches or the Japanese plums to produce themselves without stones. It was just the merest accident that I came across this wild one that is one of the parents of some of my new varieties, but that had but one third of the stone, and was a little acid fruit on a thorny bush about such as a cranberry. I had heard of it many years ago. I sent to different places in Europe and found some cuttings from France and crossed it with the French prune, and I have a great many varieties, but it has that acid taste in most of them. I have one that I am introducing this year that has a good taste, about like a French prune. It is unique and one that everybody will appreciate.

MR. BEERS (of Santa Barbara). I would like to ask if it is probable that the size of the ears of the sugar corn that you perfected can be enlarged without losing the quality of the corn?

MR. BURBANK. I think so—by selection; I do not think there is any doubt about that.

THE CHAIRMAN. Mr. Burbank, if you only have an aim and will work long enough, can you not reach anything?

MR. BURBANK. I feel a good deal like Edison; I do not feel that we have begun to touch the possibilities of plant life. It is astounding the result that can be attained by crossing and then selection. The crossing simply makes variation. I will apply that to the human race. Take the Chinese, the Maoris, or any nation that has lived by itself for a long time. There is no great variation in them; you do not see a wide variation; it is a composite race, a good many people or plants that have lived under very diverse conditions; we are a composite race. We have perhaps more crime, possibly, more insanity, and we have more variations, better people, without doubt, than anywhere else in the world, in the United States and in some of the European countries, because it is a composite race. The plant raiser has the privilege of killing off those he does not like and the improvement is astounding in some cases. I have been surprised beyond measure to see the improvement in some things by first combining two, some diverse species or varieties and then selecting. Sometimes a prize is thrown right into our lap the first thing; but it is very seldom that way. It is a long road, and it takes time to even carry on plant breeding with one species; but when you take a great number you have to make everything count. When I first began the common practice was to set out a tree and wait for it to bear. I found that that would not do; it would take all of California to have as many varieties as I wanted. So I got trees and got them to growing well, and sometimes I have had on apples 526 varieties on one tree. It was astounding to note the variation in that tree. The apple is very much crossed, anyway. It crosses in the orchard, and we had apples that came as early as the Early William, and we had some winter apples; we had sweet apples and sour apples, and oval apples, round, and every imaginable form you could find in apples, and color and everything else. You could hardly find an apple but what you could find it duplicated in some parts, looks or something, on that tree.

Plums: Usually I have from twenty to sixty or a hundred varieties on a single tree, and that is not the best of it. We grafted over all the trees one winter, and anything that did not bear the second summer, we destroyed, unless there was some very important reason for keeping it, and forty kinds to a tree. I have thousands of tree records; we get a great many varieties. Some of the soil is better than others in the same field—a tree stands at the edge of a field, or there might be a pile of ashes where you burn some brush. But if you take one tree, and put on forty or a hundred varieties you get a comparative test that you can not get any other way; then, when you get one set tested, take the best of them and cut off the worst, and put on some others. Some of the trees have been doing duty for thousands of varieties. When I first began with the Japanese varieties and hybrids, it was some two or three or four or five years for them to come into bearing. A great many of them were very thorny, just nothing but a mass of thorns, and it took a

great while to breed those things out. Now I have plums that will answer for other purposes, early, late, or fine for home use and fine for canning, and of every color; in other words, if you order any certain color, I will agree to get it in five years. No trouble at all if you raise enough seedlings. That seems ridiculous, preposterous, but it can be done. You go at it just as you go to build a house. It is a kind of plant architecture. You take your material and put it in the right place, and you graft and select until you get your fruit built up as you like it. I worked years and years on the seedlings of the white nectarine. It is very acid. The Muir peach is too sweet and is small. I got a wonderful strain of peaches from them. There are two or three varieties this year; any one who has tasted one of which varieties acknowledges it is the best fruit in the world. But it is not the best for the market; it is too soft. I got every variety from crossing a peach and a nectarine. There is very little difference between a peach and a nectarine. I have seen an old Crawford peach that was just a nectarine. The fuzz upon the peach was evidently place there by nature for protection from insects. I do not know what other use it has. It is not good to eat, anyway.

THE CHAIRMAN. Any other question you wish to ask?

MR. BOWMAN. What is the name of that peach?

MR. BURBANK. Opulent.

MR. BOWMAN. We have some Medford plum trees up in our county, but they never have any plums on them.

MR. BURBANK. The Medford plum is not a very good bearer. In some places it bears well, but it is not a plum that I have recommended these past several years; in fact, I never recommended it very much. There happened to be a northern nurseryman in my grounds, and it chanced that there was a good crop, and he purchased it right off; but I never recommended it. It is a very good plum when it gets to bearing, but it does not bear fruit well in some places under some conditions. The Formosa and Santa Rosa plums are very much more profitable.

MR. WEEKS. I would like to ask if there would be any possibility of a cross between a peach and an almond. A tree that I found out in the foothills next to a peach and almond orchard produced a specimen which I do not know whether you would call it a fruit or a nut. It had a very pleasing taste and made a very fair specimen of fruit, while the nut was very bitter.

MR. BURBANK. They are almost certain to cross; they cross as regularly as the peach. I have seen many of those. They do not usually answer any purpose. I used to think that the Japanese peach would make a splendid start, because it grew so very rapidly, but in my own experience—and I think some others have come to the same conclusion—they are not any better, if they are as good, as the French peaches; that is what I would think about them.

MR. BOWMAN. What, if anything, have you ever done in the way of propagating a resistant stock for pears?

MR. BURBANK. I have never done anything in that line.

MR. BOWMAN. In regard to the Formosa and Santa Rosa: Has the Formosa been tried out in its bearing qualities?

MR. BURBANK. Yes, sir. I understood last night from a gentleman from Vacaville it was a good bearer. I have not any reports from anywhere where it has not been a strong bearer. It is as good a plum and better than anything that was in use before the Wickson came about.

MR. BOWMAN. The Santa Rosa did very well up there and I was wondering if the Formosa did.

MR. BURBANK. It will bear more fruit in five years; it will fill up more boxes, and the tree is a very strong grower; in fact, it is the strongest growing plum tree that I have known. I have had them on my place, and two-year-old trees make branches from five to seven feet long and half an inch to three quarters of an inch in diameter in one year.

MR. CLAYBOURNE (of El Dorado County). Mr. Burbank, do you know of any blue plum that ripens along about the same time as the Hungarian that can be cross-colonized with the French prune, and be a more regular bearer? We are troubled in our county with half-bearers; some years we have a very heavy crop and next year we won't have any.

MR. BURBANK. Did you ever try the China prune?

MR. CLAYBOURNE. We have the China in that neighborhood and it seems to be a very good bearer.

MR. BURBANK. That is a seedling of the Hungarian, and I think I have grafted it over to the China.

MR. CLAYBOURNE. Grafted it or planted an occasional tree?

MR. BURBANK. If you do not want to lose a crop I would put on a graft of the China,—if you wanted to change your whole orchard, which I think would be profitable. Under those conditions I would graft it all over to the China prune. It does not take long. But I would recommend you a still newer prune, the Standard. That is going to make a magnificent shipping prune. It is sweeter than the French prune and a good deal larger than a Pons seedling. You can ship it clear back to New York when it is dead ripe, and you can keep it a week when it is dead ripe. It grows here in the coast counties just as the French prune does, but it is not as early. It comes in just the same as the French prune.

THE CHAIRMAN. I am sure we are very much obliged to Mr. Burbank. It has been a great treat to us. [Applause.]

The next on our program is "Citrus Protective League," by C. C. Chapman, president of the Citrus Protective League, Fullerton.

I am sorry to say Mr. Chapman could not be here. He promised to be here, but he said he was a very busy man and had a great many cares, and it was impossible for him to get away; but he has sent us his paper. I am sorry he is not here, because the presence of Mr. Chapman makes a good meeting. We will now listen to his paper read by the Secretary.

(The paper was read by Mr. Essig, as follows):

CITRUS PROTECTIVE LEAGUE.

The necessity for frequent gatherings of citrus growers and shippers to consider questions of vital importance to the citrus industry suggested the idea of forming a permanent organization to handle all matters of a general nature which might demand attention. In harmony with this suggestion, a convention of accredited delegates was held in Los Angeles, March 1, 1906. These delegates had been appointed at local gatherings of fruit growers in the various citrus districts of California.

These delegates, in convention assembled, selected thirty of their leading members to form an administrative committee. This committee selected seven men to take active oversight of their work, and which they called the executive committee. This administrative committee, however, outlined the work of the league and defined the powers of the executive committee. The scope of the work of the league as thus defined was to attend to questions of general and vital importance to the citrus fruit growing interests. It should be entirely separate and apart from any marketing organization of any kind, and should have in charge such matters as those relating to the tariff, reciprocity treaties, railroad rates, private car lines, routing and all other kindred matters in which the citrus fruit growers and the industry are alike interested.

The executive committee was given power to make assessments upon its members, based on the number of cars shipped, but not at any time to exceed 25 cents per car.

The executive committee employed a secretary, opened an office and immediately took up some vital questions then before congress, and with the railroads directly affecting the interests of fruit growers and shippers.

The citrus league has accomplished much for the orange and lemon growers since its organization. It secured the first reduction in freight rates on citrus fruit made by the railroads since the beginning of the shipment of citrus fruits. This was only done after a long contest, but has saved annually to the industry hundreds of thousands of dollars.

The citrus league secured the present tariff on lemons and also the continuance of the tariff of a cent a pound on oranges. Both of these, however, were only secured through the persistent and efficient labors of the league. The league has grown in favor, not only with the growers and shippers themselves, but also with the railway companies. The former have recognized the splendid work it has done in their behalf, work that probably could not have been done as well by any other method, certainly not by individual shippers and growers. The railroad companies have preferred to deal with an organization of this kind, and one which can speak with authority for practically all the shippers, than to have individual shippers or committees from shippers with whom to negotiate. As an organization, therefore, it has proved very satisfactory to all interests, and its membership is more firmly bound together and more loyal to it now after these half dozen years than at any other time.

The great lemon rate case which has been so strongly contested, and which at present is the second time before the Interstate Commerce Commission, is being handled by the league. The large fund, amounting to several hundreds of thousands of dollars and accumulated from the fifteen cents per hundred freight the railway companies claim, and which the shippers have paid, and is held by certain banks in trust pending the final decision, is being looked after and records kept by the league.

Statistics on the cost of culture and marketing of oranges and lemons, both in this country and in Europe, have been gathered and put in form by the league. This has required much time of experts and has cost a large amount. These will, however, prove invaluable in future tariff cases, especially. They will take the place of indifferent, partial and often times contradicting statements of individual growers and shippers.

I mention these matters that the practical workings of the league may

be shown. I have not, however, gone into details, deeming mere outline statements sufficient to give a clear understanding of the scope and methods of its organization and work.

It seems absolutely necessary for an industry so large and of the character of this to have certain matters pertaining to the general good handled by an organization of this kind. It has proven practical, and thus far friction and faction have been avoided. It has the support of about ninety-five per cent of the shippers, and has saved the industry many times its cost. It is to-day more efficient and exerting a greater influence than at any time in its history. It is trying to prevent difficulties rather than to fight them after they assume form, and in this way maintain harmony between and with all interests in any way touching the citrus industry.

The league has been fortunate from the first in securing a wise and competent secretary and general manager. These offices are filled by one and the same person, who is the active head of the league, under the immediate direction of the executive committee. The present secretary and general manager, Mr. G. Harold Powell, is proving, as the executive committee confidently expected he would, eminently satisfactory to all league members. He has grappled with some of the great problems with masterly ability. He not only enjoys the full confidence of members of the league, but the railway officials regard him with favor, as likewise many of our leading politicians and governmental department officials at Washington. It is necessary to often confer with these in the interests of the industry. Mr. Powell's long service for the Government, filling important positions has given him wide experience and large acquaintance which adds greatly to his efficiency as the secretary and manager of the league.

THE CHAIRMAN. I think we had better defer discussion of this, because the next topic verges into it.

May I make an explanation here? Some of you have wondered why my predecessor did not have the position of the next speaker. I wish to explain it. I was invited to meet some of the people at Newcastle, and Mr. Jeffrey was on the train with me, and I asked him about attending this meeting—I did not know that he was thought of at all to take charge of this special work in northern California—and he told me it would be very uncertain whether he could be here. I knew that Mr. Kellogg had shown a great deal of interest to this matter, and I knew he was a very able man and at that time I asked if he would take this place. Afterwards, when I found that Mr. Jeffrey would take the position, I asked him to lead the discussion, but he regretted that it was impossible for him to be here; and I am very glad to introduce to you Mr. George D. Kellogg of Newcastle.

MR. KELLOGG. It has been suggested to me that it is possible that this be deferred until Mr. Jeffrey be present. Some have the idea that he will be here to-morrow. I am just as ready now as I will be to-morrow, but I am perfectly willing to abide by the wishes of the convention.

MR. HECKE. I have information that Mr. Jeffrey will be at the session to-morrow.

THE CHAIRMAN. This matter is in the hands of the convention. Do just as you like. On general principles I do not like to break into a program.

GROWER. I left Mr. Jeffrey at the depot last Sunday morning on the early train, and he told me he would be here to-morrow.

MR. KELLOGG. I want to say that my paper would be very much strengthened by following the paper just read, but I am perfectly willing to act in accordance with the wishes of the convention.

THE CHAIRMAN. How would this do; how would it do to carry out our program of to-day, and when Mr. Jeffrey comes we will make room for him, for if we do not, we will have a program to-morrow that we can not finish? How would it do to have the discussion to-day, and when Mr. Jeffrey comes we will give him a place on the program?

GROWER. I move you that we hear Mr. Kellogg.

GROWER. I second the motion.

THE CHAIRMAN. I do not think it needs a motion, unless you object. We will then hear the paper by Mr. Kellogg on the matter of the "Deciduous Fruit Protective League."

CALIFORNIA DECIDUOUS FRUIT PROTECTIVE LEAGUE.

MR. KELLOGG. *Mr. Chairman, Ladies and Gentlemen:* I want to say that I have not endeavored to go into any particular detail as to what we might do, but I wish you would bear very much in mind the paper just read. I think we can follow out similar lines, although I did not know what would appear in that paper. I anticipated that my paper would follow that very naturally, and along similar lines. (Reads):

To me has been assigned the subject, "Deciduous Fruit Protective League," one of the most important that shall come under our consideration.

Unlike the Citrus Protective League, only, in the fact that we have the interests of different commodities to protect, and, that they have already had experience and achieved victories, while we are only in the camp of instruction and have yet to get our equipment and put ourselves in training for the firing line preparatory to the removal of the oppositions which are confronting us.

At the Watsonville convention in 1909 the Committee on Resolutions brought in a report favoring such a league, and a large committee was appointed to take the matter up and organize. In January, 1910, the committee held two meetings in Sacramento. They organized by the election of officers. They adopted the name of the "California Deciduous Fruit Protective League." They included dried fruit and the nut interests of the State in the organization. There seeming to be a lack in competent leadership available that could give their time to the work, and with no organized financial backing, the movement was abandoned for the time.

On November 6, 1911, at a large and representative convention of growers and shippers of fruit held in Newcastle, where "standardization" rules had been perfected, and the system had been unanimously continued, the convention seeing that we were advancing along correct lines, but were lacking in proper alignments and concentration of our forces, the following resolutions were unanimously adopted:

"Be it resolved by this Placer County Fruit Growers' and Shippers' Association, in annual session assembled, That we recommend the organization at once of a protective league, which will include all deciduous fruit and nut interests of California, said protective league to be properly safeguarded by a board of directors, representing

all such interests, they to employ a competent manager to make the organization effective; and be it further

Resolved, That, having confidence in the wisdom, integrity and ability of J. W. Jeffrey, we do now recommend him as manager, and invite him to take up the matter at once and perfect such a league, and we pledge ourselves to its support."

Another meeting of citizens of the Sacramento Valley convened in the city of Sacramento at a later date, at which some delegates from the Newcastle meeting were present. Advanced positions were taken, and the league was made possible by the voluntary and liberal contributions of those present from different sections of the State. J. W. Jeffrey was again the unanimous choice to inaugurate and put in motion the California Deciduous Fruit Protective League. Mr. Jeffrey accepted the position, and has established his temporary headquarters at 408 Ochsner Building in Sacramento.

While no definite plans have been adopted as yet, the Protective League has advanced beyond the embryo stage; it is born, and already showing vigorous life, and by proper care by ourselves, it may soon attain the strong stature of efficiency, and do valiant work for our united interests. I can only speak of what the originators of the plan had in mind, of the scope and objects of the league; a little more mature thought and deliberation may take from, or add to, the original plans, which appeal to my calm, unprejudiced, and better judgment, about as follows:

First, harmonize and organize all competitive interests into a coöperative league so far as exploiting and developing new markets are concerned.

The details of the plan would have to be worked out by a competent board of directors. They could incorporate in their plans some system by which all markets could be kept supplied, and the danger of over-supply for all markets be largely eliminated. The trade could also be controlled to better advantage, and dishonest dealers disciplined to a larger extent. Second, matters pertaining to transportation, export and import duties, standardization, and many other matters of common interest to the fresh, dried and preserved fruits, together with the vast nut interests of the State, this enormous amount of tonnage consolidated into a harmonious, compact body could speak with authority and power that would command a respectful hearing before any tribunal, and to a large extent get redress for any wrongs that we may become restive over.

I shall not attempt at this time to speak further of the possibilities of such a league, although I thoroughly believe that there is at this time a large open door of opportunity for its inauguration, covering the foregoing interests, and many others which may be developed by a vigorous prosecution of the plans that may be entered into by a competent advisory and executive committee, to be executed by a live and capable manager.

The manager who has already been selected and entered upon the work is well known to us all, that ex-State Horticultural Commissioner J. W. Jeffrey, who has shown great executive ability and an intelligent interest in the fruit industry of our State. He is thoroughly acquainted with our wants, familiar with this class of work, his honesty and integrity unquestioned; in him we would seem to have an ideal executive officer.

So far as I am informed, there has been no organized plan to finance this important work, other than voluntary subscriptions, which have only been sufficient to inaugurate the movement.

I trust that this convention will approve of the organization of such a league and give it some form of indorsement and render it such assistance as may be consistent that will make it effective. I presume that the league itself, through its organization, would have to devise its own financial plan that will insure its permanent stability. Our state horticultural convention will ever have a common interest in the work of such a league, and it is to be desired that there should be the utmost harmony between these organizations.

Our worthy State Commissioner of Horticulture, Professor A. J. Cook, gave his most hearty support to a movement of this kind at our convention at Newcastle, in which he pledged himself to give it such assistance and coöperation as could be found within the power of his office. So, by united effort, we shall look forward to good results coming from the permanent organization of the California Deciduous Fruit Protective League. [Applause.]

THE CHAIRMAN. This subject is now before us for discussion and for any action you may deem desirable.

MR. MERRILL. I would like to ask Mr. Kellogg, or anybody else, if they know how the executive committee or board of directors is chosen in this citrus league of the south.

THE CHAIRMAN. It was stated in the paper that each locality selected a delegate. They acted as localities first; it was absolutely informal, and each locality sent a prominent man, and these appointees met together and appointed a large advisory board, and that advisory board selected seven men—very prominent men—and they took action, and it is all voluntary. As yet there is, as Mr. Chapman says, no friction there.

MR. MERRILL. Has there been any action of that kind taken in deciduous fruits?

MR. KELLOGG. Two years ago, as appears in my paper, the motion was made. The committee on resolutions reported in behalf of such an organization, and, as I said in my paper, there were two meetings of the committee appointed at that time to consider the matter, and they met and after due deliberation they elected officers; but there was no one available to take the lead that was considered to be the person for it, and there was no financial backing to it, especially, only what we of the committee drummed up voluntarily, and the matter naturally dropped without any effort to carry it on.

MR. MERRILL. I was referring particularly to Sacramento. Have they formed an advisory committee yet?

MR. KELLOGG. As I understand it—Mr. Stephens was there; I was not there. The meeting met and there were a thousand dollars or so subscribed voluntarily in that meeting to put the league in motion, and for Mr. Jeffrey to come out and enlist other localities and organizations in the matter; and he has been holding, as I understand, one or two meetings since looking to the working up of a permanent organization. There is no executive committee organized yet. Am I right, Mr. Stephens?

MR. STEPHENS (of Sacramento). All I know about it is very little. I believe there was about \$1,100 subscribed to the fund, and that

was for the purpose of organization, going out and holding meetings, through which the league can be launched similar to that in southern California.

Mr. Chairman, and Gentlemen: Inasmuch as we are informed that Mr. Jeffrey is to be here to-morrow, I would suggest that it might be well to defer this discussion or any action on the part of the convention until Mr. Jeffrey arrives. I know what Mr. Kellogg has said is true, and I think Mr. Kellogg will agree with me that one of the reasons, and probably the most important reason—the most prominent reason—why the other effort mentioned, which he referred to, was not a success was that it lacked harmony. I realize, and I think we all realize, that it is in the interest, will be in the interest, probably as important and more important than anything else that could be done by the fruit growers of the State and the shippers of the State, to bring into existence a perfect and thorough organization of this character along the lines and plans on which the Southern Citrus Protective League is organized, but in order to do that we have got to be harmonious. It matters not to me, any more than any other fruit grower in California, and all interests connected therewith, that this league should be formed; it matters not to me who forms the league or how it is formed, so long as it is a good and protective league and brings about a condition that is needed and necessary for the protection of the deciduous fruit interests of California; and I think Mr. Kellogg will agree with me—I am heartily in accord with what he has stated—and I think it would be better to defer any further consideration of this subject until all interested parties are present, and then we can come to some conclusion and a conclusion that will bring action which will result, I believe, beneficially to the fruit growers of the State of California. [Applause.]

MR. PHILLIPS (of Fresno). Having about 150 acres bearing in Fresno County of table grapes, I turned over my fruit, as I used to do, to the fruit packers, paying twenty-five cents a crate, furnishing the crate, and shipped them East, and there they were sold as usual; and when I got my returns I found I did not have enough to pay for the picking of those grapes. I understand the people of Sacramento are in the same boat. I have listened to Mr. Kellogg's paper with great interest. I had hoped he would suggest some plan under which table grape growers might expect a fair return, but he has not done so, leaving it perhaps for Mr. Jeffrey to form such an organization that will devise some plan for getting a better price than has been obtained in the last few years. It strikes me that if we could sell the table grapes in California, instead of in the East, that we could better the conditions materially. If we are so strongly organized that we will dictate to the packer that we will not send our ten-dollar grapes East and get what we can get for them; if we can get those auction buyers to come to California, we are bound to get a better price for our products—at least, a fair return. It is discouraging for any man to plant and cultivate and bring to maturity a vineyard that produces suitable grapes for sale in the Eastern States, and be unable to obtain a better price than we have under the present system. This year we had a frost which largely cut down our product; nevertheless, we got a less price than before. I have been in the business for eighteen years and I have never had poorer returns than this year, and I have finer crops than I have seen anywhere. I will join any organization that will better the condition of the grower.

We have got to have a better price or we have got to go out of the business. I only throw out this suggestion, which is to try to get those auction buyers to buy our goods in our market; then, if we are unwilling to take the price offered, we can keep them; they make pretty good hog food. I have a bunch of hogs on my place that I have to buy feed for.

MR. BLOOMER (of Sacramento County). I should say that I think the prices for the Sacramento crops average better than any other county in the State. The growers as a rule leave them on the vines until they are well colored, and if I read the market reports right, I think our crops average about twenty cents more than from the Lodi section and other sections. Our growers in Sacramento County did not make any money on their crops, but still they did not lose very much for the reason that the crops were well colored, and I believe they carried very well.

MR. KELLOGG. In answer to the gentleman back there: I stated in the beginning that I did not propose to give any detailed method of doing things. I did not care to imperil my judgment against what a committee of seven or nine or some other number might think proper. The matter of detail, I think, should be worked out by the organization. Of course, it does not matter to-day whether the Sacramento or Lodi grapes brought the better price. The idea is to get us together in a harmonious whole, and work for the better interests of the fruit industry of the State.

MR. STEPHENS. I wish to state, in connection with this, one reason why action should be deferred was that the chairman has kindly consented to have the reports of the Transportation Committee presented to-morrow, and that possibly will bring forth some information regarding some very prominent features of interest that relate to this very thing, and then we will all be here; Mr. Jeffrey will be here. I will state that the report is printed and will be distributed as quickly as it is reported. You understand it is quite an elaborate report, and of course it would not do to attempt to read the report as a whole here, because it would probably take an hour or two to do it, but it will simply be submitted and copies will be here; they will be given to every delegate in this convention, and a good deal of light probably may be thrown upon the present condition regarding the table grape interest, and I think it would be well, if my suggestion should be accepted, to let this whole matter come up at one time. It would not take long, in my judgment. So far as I am concerned, I do not want more than five minutes to present my report, because I will stand upon your ability to read and analyze the contents of that report.

MR. BISHOP. I want to make this explanation. If Mr. Chapman had been here he would probably make it. Do not understand that the citrus league of the south has anything to do with the marketing of the fruit; in other words, it is really a political organization of the growers themselves; that is, it gives them a head by which they can send men to do certain things for them, reduce the railroad rates, take up the matter of the tariff and I could have brought figures to show how much gain we have had by the reduction of freight and other things. The marketing of the fruit is left with the Southern California Fruit Exchange and the individual exchanges which go to make it up. They handle the fruit, and handle about 60 per cent of the shipments this year, while the Citrus Protective League represents about 95 per cent of

the growers, taking in the shippers that do not go into the exchange. Then, besides that, we have what is called a supply company, which buys things for the individual members. So that the citrus league is a thing distinct and apart from any marketing organization.

MR. KELLOGG. The explanation of Mr. Bishop is correct, and it is not the expectation that this league will be formed for marketing fruit; but it is to act along the line similar to the paper read prior to mine, and I think it will prove very profitable to organize a league of that kind.

MR. ASHLEY (of Lodi). I think that we should not take up the suggestion of the gentleman from Fresno, as to mixing up the shipping end with the protective league. Lodi shipped about as many table grapes as any section, and some parts of Lodi get about as good prices as any section, but I do not think that should enter into this question of the protective league. If we are going to organize that, we should organize that along the lines of the Citrus Protective League and leave the marketing to another organization.

MR. KELLOGG. I move that the further discussion of this subject be laid over until to-morrow.

THE CHAIRMAN. We will have to-morrow a rather short session, both forenoon and afternoon, so it seems to me we can take up the matter of transportation and the league at that time.

MR. KELLOGG. For the sake of getting it before us, I move that further consideration of this question be laid over until to-morrow at eleven o'clock.

MR. ———. I second the motion.

THE CHAIRMAN. Would you not better say to-morrow afternoon?

MR. KELLOGG. To-morrow afternoon at a convenient time.

(The motion was formerly presented and carried.)

THE CHAIRMAN. I would like to say one word, although it might not be quite proper, in response to what our friend, Mr. Stephens said. I have known intimately the work of the Southern California Protective League, and I do not think there has been the least inharmony in that organization, not a particle. They have worked together as one man; and the reason why it has is that they have great big men in that executive committee. I hope you will look around and get big men who will keep the great matters ahead and work together, and then you will have perfect harmony.

MR. STEPHENS. I take exception to your remarks. There were probably the most able, intellectual minds in the world upon that committee of ten. The trouble was that they were too able, and they differed, and they differed broadly. Now, I think that the things that were taught by the experience of two years ago, or nearly so, will lead us to victory in the future. We ought to profit from experience, and I believe we will do so. Don't you, Mr. Kellogg?

THE CHAIRMAN. I want to take a little of your time. I would like to know before I speak how many county commissioners are present. That is sufficient. I am sure you will all be interested in this matter, and after what was said last night, I want to say it. As long as I am in the position of Commissioner of Horticulture there is not going to be anything to conceal. I am a great admirer of Mr. Roosevelt, and one of the things I like is absolute openness, and there is nothing going to

be in that office but what is absolutely open; and so I am perfectly willing to tell you all that has happened in regard to potatoes. Some time in November, along the latter part of November, Mr. Bowman came down to our office with some potatoes, and they were put under the microscope, and we discovered what none of you could mistake—eelworms. You may know these eelworms absolutely, because you find not only those little thread-like worms, but you also find the cysts. These belong to a group of worms that are very low in their organization; they are not insects. They are related to the *Trichina spiralis* that gets into our muscles and troubles, maybe kill us. They become encysted, and if we live 100 or 969 years, they would still remain there. This eelworm does that same thing, and in some of these potatoes we not only found those eelworms, but also those cysts. Nobody can mistake an eelworm. So we had no doubt whatever, and we ordered Mr. Bowman to send the car back, and I have no doubt Mr. Bowman did that very thing. The next came from Oroville, from Mr. Mills. Mr. Mills was very much interested, and wished to know if one of us will come to Oroville. Mr. Essig went and in three cars they found eelworms. Whether right or wrong (I claim the privilege of making some mistakes, but I shall make them as few as possible), I decided that when any commissioner found a single potato with eelworm, the entire car was to be shipped out of the State. Why? Because these eelworms will live indefinitely in the soil, and if they once got in they are little Micawbers, they wait for something to turn up—another crop of potatoes. We must keep them out. I believe they are not yet in California. Of course, Mr. Mills was ordered to send these cars back. Other cars came to Sacramento and others to Oakland. I heard of about thirty cars of these eelworm potatoes.

I decided that these cars must be returned if a single affected potato was found. The reason for this is obvious. A potato with but a few of the eelworms will scarcely show on the outside, the cuticle of the potato is very little affected. In case we find a single infested potato it is to be presumed that many may be slightly affected. Thus, a car with a single potato containing eelworms must be returned to the shipper. By this time delegation after delegation came waiting upon me and upon Governor Johnson. I do not think the Governor enjoyed it, but, like the good Governor that he is, he said if you feel sure of your ground let nothing stay you, and I will stand behind you. I am sorry for the growers in Nevada; I regret the higher prices that our consumers will likely pay; I wish that no shipper need have to pay this triple freight which is required when cars have to be returned.

This matter became so serious that I telegraphed to President Stubbs of the University of Nevada to come for a conference. As a result of this conference, I ordered a quarantine, as you know, of all of the potatoes from three counties of the State of Nevada. President Stubbs remarked, "I do not see how you could do otherwise." He was, however, so sure that certain districts were free from eelworm that I said to him, "If you will send one of your professors into the potato region and they certify to me that their region is free from eelworm, I will remove the quarantine." To make assurance doubly sure, I sent one of the students of Stanford University, Mr. D. L. Crawford, to visit these places that were declared free, that he might put his stamp on to cars

from these districts. I then ordered Mr. Essig, my secretary, to send out the notice which you will all receive upon your return home. Whether this was wise or right, it is not for me to say. I thought I was doing exactly the right thing. The day that this order was prepared I was exceedingly occupied; matters of great moment were being considered by our legislature, and my time was very fully occupied. I asked my secretary to prepare the instructions to you, which he brought to me, and which I approved. I then asked him to send them out, and this was why the order was in the form as stated by one of your number last night. I am sure that neither Mr. Essig nor myself thought to do anything that was either wrong or questionable. With this full statement of the case, I leave the matter with you, believing that as you know all the circumstances you will do us no injustice or unkindness in your judgment.

Let me add that Mr. Crawford was to be paid by the ranchers in Nevada. The more I thought of this, the more I thought I could do it safely, because I could send a man who was absolutely reliable, and when he put his "O K" on a car or a district it could be safely removed from the quarantine. If I have the power to declare a quarantine, with the consent of the Governor, I surely must have the power to remove it if the reason for its establishment is removed. If I had the right to remove a whole quarantine, I must have the right to remove a part of it. This is what caused me to send over to Nevada an expert, one of Dr. Kellogg's very able students; a young man who is a thorough microscopist, who fully knows the eelworm and one who can not be deceived, and as I know him to be entirely conscientious, and know that he will investigate this matter and will investigate with a will and determination that I feel sure no one could do aught but admire.

I dare say that Professor Woodworth is the best prepared of any one here to form a correct judgment in this matter, because as a zoologist he knows these nematodes as well as he knows insects. Professor Woodworth, will you please tell us whether you think this action is unwise or possibly wrong?

PROFESSOR WOODWORTH. I am very sorry that I did not know of this matter before, as then I would not give a snap judgment, still, knowing Professor Cook as I do, I fully believe that he handled this matter in the best possible way.

THE CHAIRMAN. I would be very glad to hear from any other commissioner if this course is worthy of criticism. Let us be absolutely frank in these matters. The Governor said to me, "Absolutely sure, if you only find one potato?" I said, "I am absolutely sure." He added, "Then I will stand behind you." Now, anybody else?

MR. BOWMAN. It seems to me that as commissioners we should all feel very grateful for that order. I know myself I have examined eleven full cars, and I do not know how many sacks outside, and we have split them open and gone through them very thoroughly, and it requires a good deal of time, and we are under bonds, and if we do send a car back and we are wrong it will be a matter of about six hundred dollars. One of the wholesale merchants of Sacramento said, "You assumed they were there; you did not know anything about it?" I said, "I am acting under law," and to please step down to the office and Mr. Essig would kindly show them to him. I believe afterwards he did go and saw the potatoes. I had sent back two full cars, and one

car I did not send it back because I was in a rather delicate position, for the reason that I could not say exactly; and I think we should be very grateful for that action of Professor Cook in putting a man over there in the field.

MR. GARDEN. I want to make an explanation of a condition that probably affects me personally as the county commissioner of San Joaquin County. When the eelworm was first observed last spring, when I was notified from the State Commissioner's office of its existence, and they sent a photograph of how it appeared when the potato was cut open, for the protection of San Joaquin County I presented the matter to the board of supervisors, and they very willingly passed an ordinance in which was included provisions covering the condition so as to protect the county from any quarantine that might be placed; in fact, there was no quarantine placed on potatoes coming from infected localities in Nevada; and seeing that they passed an ordinance including potatoes, I being county commissioner there and under bonds, if this gentleman that you have over in Nevada, whose seal would appear on the car coming in—

THE CHAIRMAN. On the waybill.

MR. GARDEN. We are not to inspect that car?

THE CHAIRMAN. No.

MR. GARDEN. This action must be accounted for, for if an infected carload should come into that particular region where they grow thou-



Potato eelworm (*Heterodera radiculicola*).

Potato on left shows effect produced upon the outside skin. Potato on right is cut open to show lesions or colonies of the eelworm on the inside. (Photo by O. E. Bremner).

sands of acres of them, I do not know just how that would affect me; whether they would get after me, should the potatoes come. Would there be any action against me, should the potatoes come in? I do not know whether there is any other commissioner that has a similar ordinance in his county.

THE CHAIRMAN. What is the substance of the ordinance? Give it in substance; you probably will not remember the words.

MR. GARDEN. It includes all fruit, vegetable seeds, and tubers.

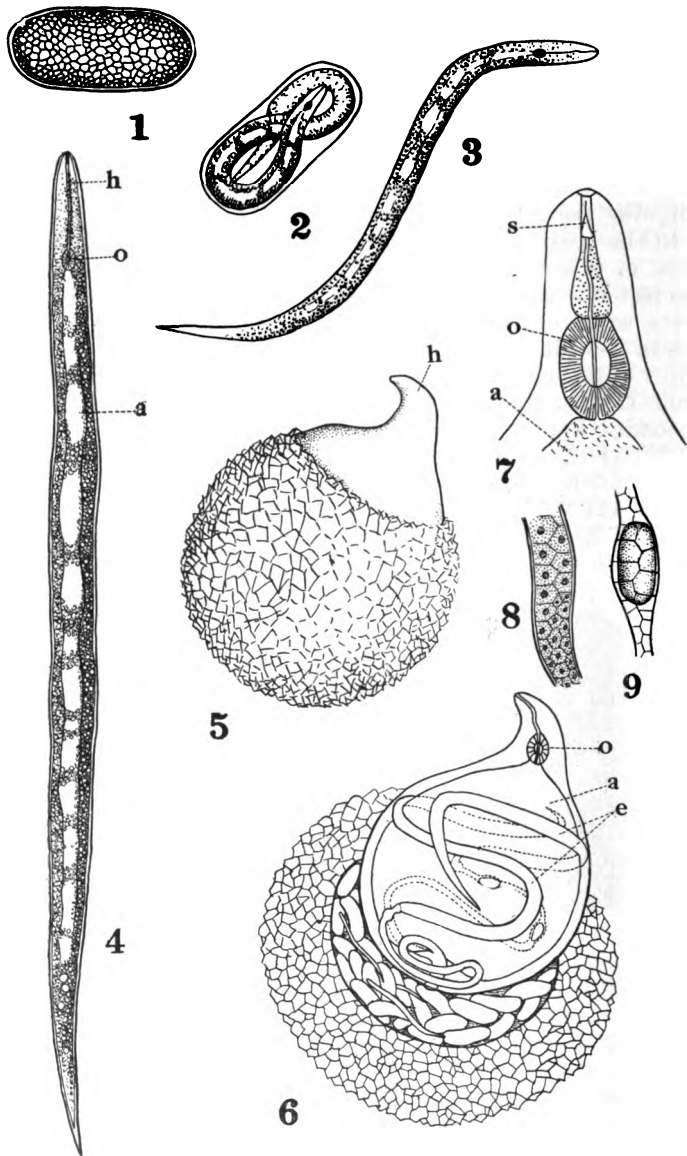
THE CHAIRMAN. From where?

MR. GARDEN. From any part.

THE CHAIRMAN. There you have got to examine everything that comes in there?

MR. GARDEN. Yes, and I have no picnic.

THE CHAIRMAN. It has not been so far.



Potato eelworm (*Heterodera radicum*).

1. egg magnified 200 times; 2. egg, showing developing larva within; 3. young larva, magnified 200 times; 4. same magnified 350 times; 5. adult female and gall, magnified 70 times; 6. same, opened, showing organs of female, and eggs and young larva as they are found in the gall; 7. head of female, greatly enlarged; 8. part of egg tube, showing forming eggs; 9. another part of tube, with a fully formed egg in it. *a*, alimentary canal; *b*, egg tubes; *c*, head; *o*, oesophagus; *s*, spear. (Drawn by E. J. Newcomer).

MR. ROEDING. I understood you to make the remark that the eelworm will go to other vegetables. Did I understand you correctly?

THE CHAIRMAN. So far as I know, we have the special eelworm that works in the potato. It has been thought that the eelworm that works in the potato is different from that which works in beets and other plants. The most recent authority says that it is same eelworm. We have had the beet eelworm in southern California. If it is true, as the Bulletin just issued by the Department of Agriculture says, it certainly must be a variety. I had not known of potatoes being worked on by the worm in question.

MR. ROEDING. I have made some experiments at several different times. I have not read the recent bulletin; I have not had time. I want to say this much. I am not in position to say whether this eelworm is like any other eelworm in California, but I want to say this, that there is not a county in California that has sandy soil that has not an eelworm; there are very few counties where I have not found them in carrots and turnips and beets and the fig trees. You can not find any fig trees growing in sandy soil that have not the eelworm. I do not venture to say that this is the identical worm that attacks potatoes, but it is a fact that we have a nematode worm in California, and the strange part of it is that the nematode worm has been found in sandy soil where no vegetables have ever been cultivated. I have had positive experience with the nematode worm myself. I carried out an experiment in the Kings River bottom for the purpose of determining whether it could be exterminated with a flood. We covered some with water, and kept them covered for a long time without their dying, and I will say this much, that the nematode worm is no new thing in California.

THE CHAIRMAN. Mr. Roeding is absolutely right. Maybe we have nematode worms right in this room. Mr. Bessey, in this last bulletin, gives this as the *Heterodera radiculicola*. It is not the name which you will find in our bulletin.

MR. WEEKS. I would like to inquire if the gentleman going to Nevada is going to examine all of these potatoes personally, or is he going to examine the soil condition?

THE CHAIRMAN. He could not do that. What he is going to do—at least, this is my instruction—he is a very bright fellow, and he will probably modify my instruction some, but what he will do is: He will say, "Are you sure in this valley you have no potato worms; are you sure you have not?" It seems to me if he does not find any potatoes showing affection, no appearance at all of attack; I think if the eelworm is there some of the potatoes will show affection which will show if he makes a thorough examination; I told him first to examine 20 per cent of the potatoes and after he became very sure, in another locality 10 per cent; and after he has done that, he will say that locality is free and he will put his stamp on the waybill of those cars or that car.

MR. WEEKS. He is not personally to examine the potatoes before they are shipped?

THE CHAIRMAN. No. It is only certain sections, where the people will say they know they are free.

MR. WETZEL. I would like to inquire into the proposition as to the state law, for a matter of information, in regard to the quarantining of shipments into the State. I understand under the state law that the commissioner, or, rather, the commissioner acting as state quarantine

guardian, serves notice on the railroad company as state quarantine guardian, and they must notify him as the quarantine guardian whenever a shipment comes from outside the State, either of nursery stock or any stock that may be suspected.

THE CHAIRMAN. Either him or his deputy.

MR. WEEKS. I understand from the state law—and I have received one pamphlet, I will not be sure; it was something like two months ago—that the determination of the inspection is strictly up to the county horticultural commissioner, to determine what must come in, and it is up to him to determine whether everything that goes into that county must be inspected. If those are the true conditions, and it is up to the county horticultural commissioner to say that everything is inspected and the eelworms are introduced in this manner, which accidentally should be introduced into the county, then they would look at it—the people would—as the neglect of the horticultural commissioner. So I feel, under the circumstances, with those instructions I have, and from the definition I have placed on the law when I started out in this business and from what I have seen of it, that it is my duty, no matter what the conditions are, to personally hold it up and inspect everything that comes into that county. As I understand it, it is my duty to do that; that is the way I have had the definition placed on the law, and it is up to me no matter what the conditions are, no matter what O K comes on the potatoes; I would have to consider it my duty to hold that up, and inspect everything as it comes in, because if the state quarantine law is going to be effective, if it is going to be for the purpose of keeping insect pests from spreading throughout the State, a partial inspection of any shipment will not determine the conditions of the entire State. You can take the same thing in nursery stock. There may be a carload of trees shipped; there may be 50 per cent of those trees good; the remaining 50 per cent may be infected. I have seen several shipments where there were conditions where stock has been inspected and bearing the name of the inspector that contained no infectious or contagious disease. The state law, of course, uses the words “infectious or contagious.” Through this means several have endeavored to take advantage of that word, and through technicalities to take advantage of people whom they would sell stock to, and have the seal of a commissioner perhaps in another state placed upon it, that there is no infectious or contagious disease so far as they can determine. Now, the question may arise how far must a certificate of inspection be recognized? How are those certificates of inspection placed on them? There is no affidavit with them. There is no sworn statement; and to what extent is a certificate of inspection good? He says, “So far as I am able to determine.” I believe that is the reading of those certificates of inspection—“so far as I am able to determine no disease exists.” Suppose these potatoes come in with the certificates that so far as a man is able to determine there is nothing on them, they are entirely free; suppose a state commissioner should inspect them and he should detect the eelworm. Any person inspecting a thing of that kind may overlook something, and another person may detect it. I think that under those conditions with the county commissioners acting as state quarantine guardians it is best for them to inspect those potatoes coming from the infected districts.

MR. SWEET. Do you think we in California are more secure by trusting a man in Nevada than by trusting to a man there and a man in each county of this State?

THE CHAIRMAN. Most certainly. I do not think there is any objection to your inspection. If you wish to you can examine the potatoes.

MR. McBRIDE. As I understand the proposition, the sending of a man back to Nevada to inspect territory is a good idea to know what district to quarantine against in Nevada, but those districts being quarantined, we as horticultural quarantine guardians must of course inspect everything from those districts, and if they are found clean, why they will not be sent back; they will only be sent back if they are infested. That is a point that I think should be considered.

THE CHAIRMAN. We have prolonged this discussion far enough. It is getting wearisome for a good many here. Let me suggest, if you think wise, that you appoint a committee to take this whole matter under consideration and then you draw up a series of resolutions, and I shall give them most thorough consideration, and they will have a great deal of influence with me; and if I can conscientiously do it, I think I would be very likely to follow every suggestion, but I do not think we had better take any more time.

MR. BISHOP. I have an announcement to make, that the horticultural commissioners will have a meeting at the hotel immediately following this meeting to take up some matters.

An adjournment was here taken.

EVENING SESSION—SECOND DAY

For this session Mr. Roy K. Bishop acted as chairman.

THE CHAIRMAN. Please come to order. We have waited a goodly time and even the secretary is absent, and we will proceed with the program in the usual order.

The first thing on the program this evening is the music. The musicians are here. (After singing by a junior quartet the proceedings were continued as follows):

THE CHAIRMAN. We waited quite a while for those who came in late, and you do not know what you have missed. That is all the sympathy I have for you. We will now proceed with the program in the regular order. The first thing on the program this evening is a paper, "Requisites of a County Commissioner," Professor Woodworth of Berkeley. [Applause.]

REQUISITES OF A COUNTY COMMISSIONER.

PROF. C. W. WOODWORTH. The County Horticultural Commission has been an institution in California for a quarter of a century. A new generation has been born and grown to manhood since the law-makers of California saw fit to establish this office. The president of this association is the son of a former horticultural commissioner, and the secretary of this association and one or two of its members have been commissioners long enough to be said to have grown old in the service, only in some way they refuse to grow old.

With this long history it would seem that the requisites of this office should have long since been established through a process of natural selection, and that the committee that planned this program would not have considered this a live issue.

I feel sure, however, that all will agree with the committee that notwithstanding this long period during which the county horticultural laws have been operative, and notwithstanding the long list of men who have tried to serve the people in the execution of these laws, there still remains a fundamental question confronting us, one worthy of the leading place on the program this evening, What really are the requisites of a horticultural commissioner?

The question is too large to be settled here to-night. It is not one to which I feel myself competent to give a categorical answer. I do believe, however, that I can present some significant suggestions, and that each one here can contribute his share towards the same end, and that as a result of the deliberations here to-night, some definite progress can be made towards its final solution.

The requisites of a county commissioner depend, of course, upon the duties which are associated with that office. There are two classes of requisites demanded of every public officer. The first is the ability to secure the office. A person with this ability highly developed we call a politician. The second is the ability to serve the people after securing the office, such a person is a statesman as well as a politician. The recent changes in the laws requiring an examination are an effort to bar out from this office those whose chief qualification was the ability to secure political support. The fact that many of the present commissioners are continued in the office shows that many boards of supervisors selected men prepared for service. It was notorious, however, that some boards of supervisors paid very little attention to the candidate's qualifications for service in making their appointments to this office. The examinations now required will bar out the more undesirable candidates and in this much assist the supervisors in their choice, but it will require the development of a strong public sentiment in many counties to insure that the ability of performing useful and not political services becomes the criterion in their selection.

That which we need to discuss here chiefly this evening is the character of the service a commissioner should render, the preparation that will fit him to render that service, and the provisions that should be made for his assistance.

Had it been possible to have drafted laws covering all contingencies in which the duties of the horticultural commissioner could have been clearly defined, the answer to the question relative to the duties of a commissioner would have been simply that they should enforce the laws. Many commissioners have pretended to assume that their duties were thus limited and prescribed, and have justified arbitrary and vicious acts on the ground that they must carry out the provisions of the law, however unjust and unnecessary the provisions may have been.

The great majority of the commissioners, I am glad to say, have appreciated more clearly the character and purpose of these laws and have tried to apply reason and common sense to their interpretation, and have endeavored to apply the principle that the object of the law was to give them the power to serve the people in accordance with wisdom and justice.

An ideal law is one in which the requirements are explicit and definite, but when the horticultural laws were first enacted, the lawmakers were wholly uninformed as to the details which would develop in their administration, and, in consequence, found it necessary to make many of their provisions vague and ambiguous, and even to-day I doubt if any feel competent to draw up a measure that would be acceptable as meeting all contingencies that might arise.

Every commissioner, therefore, must interpret the law into concrete form, having for his guidance only the abstract statement that insect pests are to be adjudged nuisances. The law makes it his duty to cause them to be abated and he is given the outline of a form of legal procedure.

The two great questions for a horticultural commissioner to answer are, first, what is a pest, and second, what is it wise to attempt to do about it? The law does not attempt to define a pest nor in any case to prescribe the process of its treatment. Some have held that any insect which fed upon any cultivated plant is a pest, and since there is nothing in the law prescribing any different attitude towards different pests, have contended that all alike must be put under the ban, but no one, as far as I am aware, has ever attempted to consistently carry out such a program.

The difficulty of defining a pest may be comprehended from a few specific illustrations. The black scale is doubtless the worst insect pest in California at the present time. Nearly half a million dollars are expended each year for its treatment on lemon and orange trees. It occurs on practically all olive trees in the same region. The amount spent for treating olive trees is a mere bagatelle, the majority of the trees are never treated, not because the insect is not considered a pest on the olive tree, but because the cost of treatment is generally considered equal to, or greater than, the benefits resulting. The insects occur abundantly on pepper trees and numerous other ornamental plants, and only occasionally do commissioners attempt to require any cleaning up of such plants. Furthermore, the insect attacks wild vegetation, is often very abundant on chaparral, but I have yet to learn of a commissioner who has construed it as his duty to drive the pest out of the brush on the mountain side. Again, the insect never occurs in the hotter interior valleys in sufficient numbers to be considered a pest, and sometimes commissioners take very drastic measures against it when coming in on nursery stock or when fruit is received that has been smutted by it.

If any insect is to be called a pest in California, the black scale deserves that designation, but commissioners everywhere have shown by their actions that they do not consider it a pest, except under certain circumstances, notably when on citrus trees or nursery stock.

Another case is the cabbage aphid. There is no question as to its importance as a pest where cabbages are grown for eastern shipment. I have yet to learn of a horticultural commissioner who has made a serious effort to have this nuisance abated. The insect occurs abundantly on mustard, here again no one has attempted to do aught towards its destruction.

Here is a case where as by common consent an important pest is ignored. One of the insects specially mentioned in the law, the codling moth, which easily occupies the first place in America among the insects

directly attacking fruit, has received very scanty attention by horticultural commissioners. Once in a while notices have been served on orchardists, and almost always the matter has dropped there. Occasionally a commissioner has condemned infested fruit, but nowhere has there been any consistent policy pursued excepting in those counties where it has been consistently ignored.

One might go on and present example after example, showing that in actual practice in the administration of the horticultural laws the commissioners have made distinctions between insects and between the conditions of their presence, not in accordance with any well worked out policy nor with any attempt to secure consistency or uniformity. This state of affairs represents a deplorable condition that this association should recognize and set about to remedy. The meaning of this irrational method of procedure is the fact that the two great questions propounded above, "What is a pest?" and "What is it wise to attempt to do about it?" have been differently answered by different commissioners.

If the first question was simply the identification of the species, there is no doubt that the ability to recognize the various species of injurious insects would stand as a qualification of first importance. If all insects could be classified as saints or sinners, the horticultural commissioner could stand as St. Peter at the gate separating the good from the bad and condemning the latter class to destruction.

We can quite easily make catalogues of injurious insects. The distinguishing characteristics of most of them can be readily made out, but when all this is done my contention is that we have only made a beginning in answering the first question.

The second question according to the wording of the law and according to the evident intention of the original writers of the law is answered by the word "eradicate." Many commissioners when new to this business attempt to carry out the literal meaning of the word, and many more imagine that they are doing so when had they been capable of an ordinary degree of observing power they would have seen that such was not the actual result secured. On the other hand, there are conditions under which eradication has been secured and occasions where eradication should be secured. It should be clearly understood that none of the methods of treatment recommended or used for the control of insects in orchards is calculated to eradicate the insects concerned, and if it were the duty of a commissioner simply to eradicate all insect pests, he would have to limit himself to extraordinary methods and would have nothing to do with all the means for control that have given economic entomology its importance in the horticulture of the present day. The obvious significance of this discussion is that the wording of the law gives no clue to the answer of the second question and that the qualification of a commissioner, in order to enable him to decide this question for each specific case, must be far greater than a knowledge of a number of formulæ for insecticides.

It is easy to test a candidate's ability to identify injurious insects and his knowledge of the compounding and application of remedies, and this can and should be done in the examination of candidates for this office, but beyond all that, and more important than all that, is that qualification, hard to accurately measure, which, because of its rarity, is called common sense. Experience with common sense constitutes a better

equipment than the accumulation of such a store of facts as is necessary to pass an examination. I would by no means eliminate the examination, since no one not willing or able to prepare sufficiently to pass it should be intrusted with the responsibility of this office.

After the examination is passed and the office secured the work of preparation is by no means finished. If experience is to be of any value he must keep in training. Knowledge previously more or less theoretical and general must be made practical and specific. It is inevitable that as soon as a man ceases to learn he begins to lose. That which he learns he should share. The reports which the law directs should be submitted to the state commissioner should have given opportunity in this direction, but the policy of that office kept them in the form of brief administrative reports of exceedingly little value. The bulletins issued by Santa Cruz County, and the recent reports from Ventura and Placer counties, should be only the beginning of a great development of this idea. The monthly publication to be issued by the present administration of the state office will open the way for much work of this kind. We should make definite, positive progress in our knowledge of the injurious insects of this State and in their economics. The past twenty years has not seen very much progress of this sort because the discoveries of each commissioner have remained buried and not published for the benefit of others; indeed, without publication most of one's observations remain incomplete and inconclusive, and it is only in the process of preparation of the manuscript that the necessity of supplementary study becomes evident and is carried out.

A commissioner should consider himself only as a temporary holder of an office which will exist long after he has passed beyond and his duty is not alone in the present, and that he should leave for his successors in office as full an account as possible of his observations, so that each may not be required to laboriously acquire that same information, but be enabled to progress to new knowledge.

The organization of this association shows that the members appreciate the advantage that may come through coöperation, but I am sure the association has not begun to perform the amount of service it is capable of doing, and the one point at which the most evident progress can be made is the unification and standardization of the work of the different counties. It ought to be possible to work out a uniform plan upon which commissioners will agree, eliminating much useless and meaningless work that now takes up the time and energy of many commissioners, and concentrating on a joint attack where the greatest benefits can be secured. In fact, transfer a guerrilla warfare to an organized assault, and the crystallizing finally the results of these labors into laws which shall be reasonable and efficient.

The horticultural laws have been tinkered at in nearly every session of the legislature since their first enactment, but in no case has this been done after mature consideration by a responsible body nor with a representation of all the interests involved. In no case has there been any adequate study of the laws of other states and countries, nor in any case an attempt to adjust the laws to the definite conditions found in actual practice.

I would like to suggest in closing, as the work that most needs to be done towards improving the conditions for present and future commissioners of horticulture, the appointment of a permanent committee on

the "Unification of Horticultural Inspection." That this committee consist of members appointed by interested organizations. I would suggest the naming of one member by each of the following officers and organizations: the State Commissioner of Horticulture, the Director of the Experiment Station, the State Association of County Horticultural Commissioners, the State Association of Nurserymen, the Citrus League, and the Fruit Growers' Convention. That this committee consider and report upon all proposed changes in the law; that it gather together all available information concerning similar work in other states and countries, and make a special study of the practice of the horticultural commissioners in this State, and that they formulate and submit plans of procedure and draft such amendments to our laws as may seem wise. Such a committee carefully selected would seem to be the best means available for improving the character of the work of the office of county horticultural commissioner. [Applause.]

THE CHAIRMAN. This question is now open for discussion, and I venture to say that Mr. E. O. Essig should lead in the discussion.

MR. ESSIG. *Mr. President, Commissioners, Ladies and Gentlemen:* I think we ought to compliment Professor Woodworth on his paper, because he has covered the field very well, and has analyzed the situation in a way that is available to every commissioner and every fruit grower here. I am sure there is not one of us but that has got some insight and some method by which we can improve our methods and our equipment as officials in the State service; and in answering or leading a discussion of this paper I wish to assume, as I am sure Professor Woodworth assumed in his paper, that the county horticultural commissioner in the first place is qualified from the viewpoint of knowledge to conduct that office as it should be conducted, as a horticultural commissioner he has passed the state examination and he has qualified under a civil service examination, and that point I do not think needs to be discussed.

There is one thing and only one that I desire to enlarge upon, and that is this: It seems to me that every horticultural commissioner must first consider that he is working for the people, and in all his dealings with the people he must keep that one point uppermost. As Professor Woodworth has pointed out, the law is worded so that the commissioner has power to do things which are not right from the viewpoint of the people, and in considering the people he must not only consider those of his own county, but he must consider the people of other counties. For instance, if there is an inspector here who has turned down nursery stock from another county that is badly infested with what is known to be one of the worst pests in the State, and as a retaliation for that his fellow commissioner turns down nursery stock from his county, because of some inferior so-called pest, you can see at once that the latter commissioner is not only retaliating, but is working a hardship in one county and hurting the growers in his own county, because his growers have paid for that nursery stock. There are a number of other instances that I could cite on this line. I believe that the horticultural commissioners as a rule are coming to realize that this is one of the most important duties that they have, the ability to see what is best for their growers, regardless of what is specified in the law. And, gentlemen, I believe there is not one of us here but that will study our work, know the conditions in our county, know the conditions in other

counties; but what is using what has been pointed out in a number of instances as common sense—and gentlemen, that common sense can only be had by thorough work, by thorough study of conditions, and by the ability to become a growing man, to take on new knowledge; and these conventions I think are such as give us the knowledge to decide what is right and what is wrong under certain conditions, and we have had illustrations in the conventions in the past, and we have had illustrations in the convention at the present time, that every one of us needs to get in touch with the other man in order to find his viewpoint, and in order to find out that which is best for his county. I thank you. [Applause.]

THE CHAIRMAN. This question is now open for discussion by any one who wishes to discuss it.

MR. PEASE (of San Bernardino). *Mr. Chairman, Ladies and Gentlemen:* I think that every commissioner almost has different conditions in his county that require some different methods in handling his work. Of course, I can only speak for the conditions in San Bernardino County, which grows largely citrus fruits.

There is one point which I would like to take issue upon with the professor, where he says that there is no systematic work done against the codling moth in our orchards. We have any number of orchards in San Bernardino County; we have quite an acreage. Nearly every progressive grower has one or more power sprayers and he sprays every season against the codling moth, and the mildew. His work is systematic. As far as our work is concerned in the citrus orchards, our fight against the pests, we aim to be perfectly systematic. This year the supervisors concluded to go out of the fumigating business and turn it over to the growers, and the result was that we had twelve fumigating associations formed throughout the county—twelve new associations formed. Some of the older workers in fumigation are conducting the work, as with the new ones you can not get as good work from the start, until they have had the experience of teaching; you do not do quite as systematic work as you can with those who have had previous experience; but I will say this: The twelve associations have a thousand tents that have been operating this year. Every tent is marked to ascertain the distance over the tree; every one of them uses the government scale of dosage. The apparatus is kept in good order and I think that is as good work as can be done in the line of fumigation. [Applause.]

MR. CUNDIFF. I was very much pleased with Professor Woodworth's paper. I think it was in the main a very interesting and useful one. There is just one point that the professor has made in his paper that I think is wrong. He speaks of the black scale not being a pest in the interior valleys. I presume our valley would be called an interior valley—sixty miles from the coast. Well, now, during the past five years we have expended perhaps double the amount of money fighting that scale, as we have red or yellow scales which were formerly the only pests we had. That condition has not always been so, however. Up to twelve or fifteen years ago the black scale was not a pest in our district. We would find a few specimens here and there, but it never increased to the proportions of a pest; but through climatic conditions or something there has been a change, and the black scale is as bad in there as in other districts where they let it go; and I think the same will apply to San Bernardino County. I think they have some black scale over there.

I think Mr. Essig referred to the shortcomings of the commissioners at times; I think that was touched upon by Professor Woodworth. Now, we can no more have perfect horticultural commissioners than you can have perfect county clerks or any other officials that you may have. We have, I believe, in this State horticultural commissioners that will compare in efficiency and in their zeal and enthusiasm for doing their work with any other class of officials we have in our county. I think that could be easily demonstrated by visiting the different counties and seeing the efforts they put forth to protect their particular county. The only point that I wish to touch upon was in regard to black scale. Professor Woodworth is absolutely right in reference to the condition of the interior valleys up to twelve or fifteen years ago, but it does not apply now.

MR. GARDEN. *Mr. Chairman and Gentlemen:* There is one thing—I do not know how many have thought of it—but there is one very good sign of the efficiency of the county commissioners in general; not that I am going to take any credit to myself: But we county commissioners have been under the law since the day of our appointment. It only takes a vote of twenty-five men to bring us up before the board of supervisors, and if there is any shortcoming in the performance of our duties that is the end of us.

MR. BOWMAN. I would like to speak to the point that the professor spoke about, the uniformity of methods. I believe in our little meeting that we had after the afternoon session it was brought up, and as I understand it, we are going to meet oftener, and we are working on that very scheme. I think Mr. Woodworth's article is very pertinent.

MR. VOLCK. Professor Woodworth's paper brought out the point quite specifically and suggested that certain people should be appointed to form a committee to take up this work; and I think that is a most excellent suggestion, and I would like to put it in the form of a motion, that as far as the horticultural commissioners' association is concerned, that we do appoint such a member for such a committee, and bring forward the matter as far as is in our power to do so.

MR. BOWMAN. I second the motion.

THE CHAIRMAN. You have heard that motion and it is seconded; Are there any remarks about it?

MR. BEERS. I would like to have an idea of what that motion embodies?

THE SECRETARY. Professor Woodworth in his paper suggested that a committee be appointed, consisting of a member of this body and other bodies, the Fruit Growers' Exchange and the Nurserymen's Association, and so forth; now Mr. Volck moves that this association proceed to appoint a member from this body towards forming that committee.

MR. BEERS. What is the duty of that body?

THE CHAIRMAN. Professor Woodworth, will you explain that?

PROFESSOR WOODWORTH. If I read the last paragraph of my paper it will give the suggestion in concrete form (reads).

THE CHAIRMAN. That really is a legislative committee.

MR. BEERS. I would like to ask if Mr. Volck in his motion desires to embody in his motion the suggestion contained in this address; is that the intent of his resolution?

MR. VOLCK. My motion was to the effect that this horticultural commissioners' association take the first step, or take the necessary step, and appoint its member of this particular committee, and the committee's duties—their field of action will be largely as outlined in the last paragraph of Professor Woodworth's paper. Of course, that lies with them; they can widen or narrow the scope of their own action.

THE CHAIRMAN. Mr. Volek, I do not want to word your motion for you, but how would it do to state that we endorse that sentiment and appoint a committee, and request that these bodies also appoint one?

MR. KELLOGG. I think that would be a better motion.

THE CHAIRMAN. You have heard that motion, and there is a second to it. Is there is any discussion?

MR. CUNDIFF. I do not doubt the advisability of a committee of this kind; I believe that the professor is absolutely honest in making this recommendation; but it could only, in the nature of it, be advisory. We operate under a specific law, a state law, and you could not make anything of a committee of this kind. It would simply be advisory, unless your law is changed; and again, owing to the diversity of production, the difference in conditions over the State, I see no possible way how you could have any unification of inspection. That must be largely governed by conditions. The same matter has come up in regard to a uniform inspection law, which is an impossibility, because the supervisors of each county are a law unto themselves in enacting such regulations as they see fit; hence, any movement of this kind must be in its nature absolutely advisory; it cannot be a legal proposition; and I can not think that anything can be gained, from the simple fact that each commissioner in his own county ought to be the judge of the particular conditions that confront him; and if he is competent to fill the commissionership, he ought to be able to exercise his best judgment without interference from outside conditions. I for one am not in favor of the motion.

PROFESSOR WOODWORTH. I would like to say a word in answer to what Mr. Cundiff has said. All committees are absolutely advisory; whatever committee was created, it simply is to look over the ground, gather the information together, and if this committee, representing all interests, can agree upon anything to present to this body, and to the other bodies concerned, and they can endorse that, then we possibly can make progress. The intention of the organization of the committee is to have some organization that will take the trouble of making the necessary study, so that we can be informed. Perhaps the committee, if appointed, will come to the same conclusion that you have at the beginning; and in that case we will know that we at least have looked over the ground and can judge whether that was the correct statement of the case. Now, it may be that the very highly developed work of Riverside and San Bernardino counties is the same as it ought to be everywhere, and possibly that will be the outcome, that the whole State will come to be elevated up to the level of the complex method of procedure that has been highly developed in those southern counties. Maybe it will be something different. But all the time, urging this forward, that we will have a body that will thoroughly go into the subject from every possible point of view, and then report back to these various organizations that contribute towards that committee what the findings are after this study.

PROFESSOR COOK. May I be permitted to speak?

THE CHAIRMAN. Certainly.

PROFESSOR COOK. I think it is an excellent suggestion. To illustrate my view of it: We have now rather a curious law. It is a combination of two laws and it was not studied enough. We have to get help to know what the law is, and I think the attorney general is in doubt. A committee hastily formed—I was one of them—formulated the new law. If such a committee as Professor Woodworth suggested was formed and commenced right off, this ambiguity would be done away with. In regard to the other matters that Professor Woodworth spoke of, in some of the counties south, and, I suppose, north, that are working together, they are following the block system, cleaning up as they go along. They are not doing that in all counties. It is quite possible that some such arrangement as this would get all the counties to adopt methods that are now followed by the most progressive. No county is ahead of San Bernardino County; there are twelve organizations taking up the matter in a systematic way. I think Riverside County is doing the same thing.

MR. SHAW. A year ago you appointed a committee, something in a similar way, and that committee met. Professor Woodworth was a member of that committee. As a result, you have your present uniform insecticide law. Now, it seems to me that this is a move which can be made in the same way. Your committee that has been suggested can meet; can frame a law, put it in the hands of some good member of the next legislature, and it can be made a uniform law; and I believe the suggestion is a very good one.

MR. CUNDIFF. Just one moment. I do not want to occupy more than my share of the time. Professor Cook refers to the law as being ambiguous. Perhaps it is in some respects. At the same time we are doing excellent work under the present law. Almost every legislature there is a bill up for changing this law. I do not know whether all changes have been improvements or not. Now, I do not believe that a proposition of this kind, except just as an advisory proposition—which, of course, if it is an advisory proposition can be best taken hold of among the the commissioners themselves without outside interference. I will tell you why: you may appoint—and I think every commissioner in this room will agree with me upon that proposition—you may appoint the most intelligent growers that you have in any community, and unless he has been in touch with this work, unless he has filled the position of a commissioner for a considerable period of time, he is not in a position to know the various conditions that you have to meet. Every commissioner has to use his judgment. No commissioner can absolutely act always according to law. He must have discretionary powers. We all do it. The commissioner would not last very long in any county that would attempt to go out and enforce the law absolutely to the letter. He can not do it, because public sentiment in his county would be against it. But we do, so far as we can, educate our people as to the advisability of the work. I am doing work in my county; I am following the block system, and I am perhaps going over three thousand acres in a block. We are operating three thousand tents in our county, so we are doing a little of that work ourselves, and I believe I can say, without any criticism, that Mr. Pease and myself are able, and have been able

for several years, to keep our county, considering the large acreage that we have, the cleanest of any in the State. But how have we done it? Simply, we have worked upon the sentiments of the people. It has been an educative proposition with the people. We can do things to-day that we could not have done ten years ago—five years ago, possibly. Mr. Pease will bear me out in this. But it is a matter that must be brought about by the commissioner. He must get the confidence of the grower. He must be able to convince the grower that such methods and plans worked out will mean dollars in his pocket; and when you touch a man's pocket-book you get pretty close to him. If you bring that out and show him that certain methods will in the end save him money, you can make a friend of him, and later on you have the majority of the county with you, because you have proved what you can do. Those are conditions which must be worked out by the individual commissioner. If a man has not the ability to do that, he is not the man for the position. I believe any condition of this kind should be worked out mainly by the horticultural commissioners, from the simple fact that however intelligent your grower may be, their information is not along the line of what the horticultural commissioner has to do. It would not be in our section of the country, and I dare say it would not be in others.

THE CHAIRMAN. This motion is before you. If you are ready for the question I will call for the vote. Those in favor of the proposition say aye. Contrary no. Lost—at least, the noes made the biggest noise.

MR. SHAW. I want to say that the shippers' organizations that are here recommended are all in the fruit business; they all know something about this, know quite as much as your worthy commissioners that you have for certain counties, but your Fruit Growers' Association will be apt to know as much. I think the proposition would be safe—

THE CHAIRMAN. That question seems to have been settled, inasmuch as the motion was lost.

MR. WILSIE. I thought the intention of Professor Woodworth in regard to this was to clear up any ambiguity that might be in the State law, and by that means protect the horticultural commissioners as they did in the states of Oregon and Washington.

THE CHAIRMAN. The motion is lost now. "The Relation of County Commissioner to the Nurseryman," by A. R. Galloway of Santa Rosa. [Applause.]

RELATION OF COUNTY COMMISSIONER TO THE NURSERYMAN.

MR. GALLOWAY. My fellow commissioners, as well as the nurserymen, no doubt will agree with me that the subject assigned is a practical one that ought to be clearly understood by all the parties concerned, which necessarily includes the grower.

For a considerable part of the year our duties as commissioners bring us in more or less direct relationship with the nurserymen, not only of our respective counties, but with those of other counties, states and countries.

It is well that we consider carefully these relations existing between us in order that we as commissioners may perform our duties and dis-

charge our obligations in a just and equitable manner to all concerned. In order to a clearer understanding of these relations let us consider briefly the work and duties of each party, and what is reasonably expected and legally demanded of the nurseryman and the commissioner.

There can be no question as to the usefulness and necessity of the nurseryman in the promotion of horticultural interests. One of the first and most important requisites in starting an orchard is the proper nursery stock to plant, which the nurseryman is depended on to supply. It would be impractical and entirely out of the question for each fruit grower to undertake to produce his own nursery stock. Comparatively few fruit men are sufficiently skilled in all lines of nursery work to make a success of the business, even if they possessed the soil and the favorable conditions required for the best tree development. The nursery and the nurseryman sustain about the same important relation to horticulture, in the promotion of growth and development of plant life, that the home and nurse do in the nurturing, fostering and training of infant life in the development of the human plant.

What is demanded of the nurseryman? He is expected to furnish clean, healthy and thrifty trees which are true to name. This requires that the stock must be free from all insect pests and plant diseases. He is also required by law when shipping his stock to plainly mark in a conspicuous manner on each package the name and address of the shipper and the name of the party to whom it is shipped and also the name of the place where grown.

In order to meet all these requirements the nurseryman must be skilled in his business. He should be a soil expert, so as to be able to select the soil best suited to his use and then maintain its fertility by keeping it supplied with the plant food necessary for the normal and healthy development of his trees. He must know how to prepare his ground and keep it in the best condition for plant growth. He should have knowledge of how to plant the seed or the pits to produce the seedlings, or at least be a good judge of seedlings for use in the nursery. Then follows the transplanting into the nursery rows. Another important step in his work is the selection of buds or scions from which to produce his stock, followed by the skilled work of budding and grafting. After this has all been well done comes the watchful care of the trained nurse necessary to promote health, growth and development. This care includes the keeping of the tender growing plants, root and branch, free from insect pests and plant diseases.

This is all followed by the proper digging or removing from the nursery, sorting, grading, culling, disinfecting, packing, labeling, and final distribution.

Having outlined the work and obligations of the nurseryman and considered what is expected of him with the necessary steps to meet these requirements, we will in like manner consider the duties of the county commissioner, that we may discover the points of contact and better define the relations existing between us.

It is admitted to begin with that there is a difference of understanding among us commissioners as to just what the nature of our duties and the limitations of our activities are. At some of our previous conventions there have been discussions in which widely divergent opinions were expressed in regard to the nature of our work. Some have taken

the position that we are simply the administrators of the horticultural and quarantine laws and that our duties and obligations are confined to their enforcement, our position being that of tree policemen. While others hold that we are horticultural teachers and advisors, our duties being educational in nature, it being our business to give instruction in any department of horticulture when called upon for information. While our duties as prescribed by law appear to favor the first position most, it seems to me that the second is also clearly implied, so that both are included in what may be reasonably required of us. It should not be our policy to render as little service as possible, refusing to do anything that is not clearly mandatory, but rather to render the greatest possible service consistent with all our duties.

The state law gives us full control over imported stock, affording our growers protection from the danger of introducing new pests from other countries on infested nursery stock, which is subject to our inspection. The county ordinances generally give the county commissioner absolute control over all nursery stock of every kind that may be shipped in from other countries or states.

As an example of the county ordinances, I will give a part of Ordinance 26 of Sonoma County, which places a quarantine on all nursery stock of every kind, for the protection of the horticultural interests of the county.

"SECTION 1. No person or persons, corporation, or corporations, either as owner, agent, factor, broker, servant, or employee, shall bring for delivery into Sonoma County, California, from any place or places without said county, any trees, plants, vines, shrubs, scions, cuttings, or grafts, without giving notice of their arrival at their destination within twenty-four hours thereafter, to the horticultural commissioner of said county, or to the local inspector of the district into which the same are so brought; nor shall either of the persons or parties above named remove or use, or cause the removal of the same from the place of their arrival at their destination, until inspected as hereinafter provided."

Section 4 makes it the duty of the county horticultural commissioner to enforce the provisions of the ordinance and authorizes him to make such rules and regulations as in his judgment are necessary to make the ordinance effective.

Section 5 of the same ordinance makes the violation of any of its provisions a misdemeanor punishable by fine or imprisonment. The state law also makes it the duty of the county commissioner whenever it is deemed necessary to cause an inspection to be made of any premises, orchards, or nursery, or trees, plants, vegetables, vines, or fruits, or any fruit packing-house, storeroom, salesroom, or any other place or article in his jurisdiction, and if found infested with any infectious diseases, scale insects, or codling moth or other pests injurious to fruit, plants, vegetables, trees, or vines, or with their eggs, or larvæ, or if there is found growing thereon the Russian thistle or other noxious weeds, to notify the owner or owners, or person or persons in charge that the same are infested with said diseases, insects, or other pests, and require such person or persons to eradicate or destroy the said insects or other pests within a certain time to be specified. From the provisions of the state law which have just been cited, we learn that it is the duty of the county commissioner to inspect the nurseries and every kind of nursery stock in his jurisdiction, and wherever infectious diseases or insect pests are found, to require the same to be eradicated or destroyed.

A careful consideration of the duties of the county commissioner, as defined by the laws governing our work in relation to the nurseryman,

makes it obvious that these laws were enacted for the express purpose of protecting the growers and promoting the horticultural interests in our respective counties. Since the duty of administering these laws and enforcing their provisions devolves mainly on us, we are required to stand between the nurseryman and the grower to see that the nursery stock furnished him is free from insect pests and plant diseases.

The county commissioner sustains a little different relation to the local nurseryman, in some respects, to what he does to the outsider who is shipping stock into his county. The nurserymen in our jurisdiction have the same claims on us for service that our growers have. They have the right to call on us at any time to inspect their nurseries or their stock, and if the same is found to be in satisfactory condition they may require us to furnish certificates for the stock inspected, and if found infested require us to direct the disinfection of the same, and in case of securing stock from other nurseries, to inspect it as we would for the orchardist.

The local nurserymen in common with the growers of the county are very much interested in preventing the introduction of more pests through infested nursery stock from outside sources. In considering these different relations between county commissioners and nurserymen, the question may arise, Is there any real need, after all, of an inspection service? Would not the nurserymen furnish just as good stock without this extra expense and inconvenience?

That depends, to some extent, on how well inspectors do their duty. I have noticed, and no doubt many of you have, that after stock has been condemned a time or two from any given nursery for some particular cause, the following shipments are generally all right. There is no doubt that the nursery stock which is distributed, especially that which goes to other counties, averages much cleaner and healthier than it would if there were no inspection service at its destination.

When we consider the cost of producing nursery stock, and all the labor and pains required in getting it ready for distribution and the necessary losses involved in careful culling and grading, we can easily understand the temptations to laxity in culling out all the defective and infested stock, especially where the infestation is slight and rather difficult to detect. The same motive prompts the unscrupulous nurseryman to mix defective and infested trees or plants in with his good stock that influences the fruit grower, who purchases this infested stock to his lasting injury, when disposing of the products of his orchard to pack inferior and infested fruit for the market to the injury of the fruit industry, or to put the little green berries and culls on the bottom of the baskets, beautifully faced over with large ripe, luscious berries, well calculated to tempt the appetite and induce the unsuspecting consumer to pay for value he does not receive.

There is also a risk to be run in getting trees from the conscientious and reliable nurseryman, for it is impossible for him to do all his work or even oversee all the details of his business, so he must necessarily depend largely on his employees, and there are very few of them who are as careful and painstaking as their employers would have them to be.

Then there is the very common practice among nurserymen, when they are unable to fill their orders from their own nurseries, to secure the stock needed from other sources where it can be most cheaply and conveniently obtained. On account of these and other dangers, it has

been wisely provided by law that competent inspectors, who have no financial interest in the transaction, shall examine all nursery stock of every kind at its destination, and shall allow no diseased or infested stock to be released from quarantine to be planted, unless it is first thoroughly disinfected.

The position of the county commissioner in his relation to the nurseryman, being placed as he is by law, between him and the fruit grower to safeguard the industry, is one of prime importance to horticultural interests, so that the board of supervisors, to whom he is required by law to make monthly reports, should keep in touch with the commissioner's office and see that he is sustaining the proper relations between the nurseryman and the horticulturists in protecting and safeguarding the industry.

The prudent farmer or gardener before sowing or planting is careful in the choice of seed and plants, realizing that very much depends on the selection of clean seed that will grow and produce crops of the best varieties of cereals, vegetables or other annuals, where only one season's crop is involved. It is scientific, as well as scriptural, that we shall reap whatsoever we sow, hence the importance of selecting good seed unmixed with anything foul or noxious in nature.

This being true of annual crops, how much more important it is in the planting of orchards where a term of years, accompanied by toil and expense, is required before the grower can even begin to reap his reward, which ought to be followed by decades of profitable harvests to repay him for the heavy expenses and long delay before he begins to realize on his investments. On this account we can not fail to be impressed with the important position occupied by the county commissioner in his relation to the nurseryman.

Occasionally doubtful problems arise where there are wide differences of opinion known to exist in which the interest of the nurseryman is opposed to that of the grower. A case in point is with reference to the crown-gall, which we have been informed by government experts is a bacterial plant disease resembling in some respects the malignant tumors of animals, and yet we find in the preamble to a resolution which was unanimously adopted by the thirty-fifth annual convention of the American Association of Nurserymen held at Denver, Colo., 1910, that it is set forth that "The hard or hairy form of root or crown-gall has not been found injurious or contagious to apple trees," and in the resolution that follows the advisability of admitting such stock is strongly urged.

Wherever abnormal growths are found caused by any disease, giving rise to a question as to whether the disease is injurious or not, there can be no doubt that the grower is justly entitled to the full benefit of the doubt, for the obvious reason that he has so much more at stake.

If by chance an occasional good tree should be condemned and the nurseryman lose the value of his tree, is that not much better than to take the risk of the tree being infected with some contagious disease that will not only cause the grower to lose the cost of the tree, which is a small consideration compared with the ground allotted to its support, which is worth probably from twenty to fifty times the value of the tree; not only that, but the possible menace an infected tree may be to the surrounding trees.

The more careful and painstaking the nurseryman, the more likely he

is to favor a rigid inspection service and heartily coöperate with the county commissioner in his efforts to enforce the horticultural and quarantine laws. If he is careful to send out nothing but clean, healthy and thrifty stock, he has nothing to fear from inspection, no matter to what county it is sent, but this to gain, in that all infected and defective stock is eliminated from every other source, thereby reducing the supply that would take the place of better stock, and consequently lessening the competition which he otherwise would have to meet.

The careful, conscientious nurseryman stands in the same relation to the county commissioner and his inspectors that the peaceable, law-abiding citizen does to the policeman and other peace officers, in that he has nothing to fear, but is benefited and safe-guarded by the officers in their enforcement of the laws of the land. [Applause.]

THE CHAIRMAN. After I had decided that Mr. Galloway was to handle this subject, I thought that the nurserymen ought to be given an opportunity to support their side of the issue, instead of having it supported by a commissioner, and I thought it would be well to get the biggest and strongest man that the nurserymen had in this State, so that he would stand and come off without serious injury from the shafts he would receive from the commissioners; so I will call on Mr. George C. Roeding of Fresno to open this discussion.

MR. ROEDING. *Mr. Chairman, Members of the County Horticultural Commission, Ladies and Gentlemen:* I fully expected on this occasion to receive a very severe roasting, and as I am so much accustomed—have always been so much accustomed to listening to a severe roast, as a nurseryman—I must say that the mild remarks of the many extenuating circumstances which Mr. Galloway, my friend, made in behalf of the nurserymen, has almost taken the wind out of my sails.

I attended a banquet a short time ago, and those speakers who use a little more time than they were entitled to were quietly brought to their seat by a long stick to which there was attached a very formidable hook, so that whenever a man heard that there was a hook to be extended, he immediately sat down. I want to say to you now, if I occupy too much of your valuable time in the remarks which I intend to make to you, that all you need to say is “apply the hook” and I will take my seat.

I made a few informal remarks last night in discussing a matter which would be brought up later, and in doing that I spoke as a fruit grower, not as a nurseryman. It is very fortunate for me, and I think rather fortunate for the assemblage here, that I am a sort of a chameleon, because they would not get the fun out of my address if they thought I was a fruit grower. I am happy to say that in the last few years the personnel of our horticultural commissioners has been very much improved. I think that the recent adoption of a law by which those commissioners were examined by the men who were appointed by the State horticultural commissioners, or, rather, men who were selected for them to pass an examination before they were accepted as a commissioner in their respective counties, will do much to advance the work of the horticultural commissioners of this State.

I want to state further that I do not think that the nurserymen of the State of California should be regarded in any other light by the commissioners of horticulture than they would regard a fruit grower. I was pleased to note in the remarks made by my friend Mr. Galloway, that

he even went so far as to call a nurseryman a trained nurse. You know, gentlemen, to see me and to call me a trained nurse, sort of places me on a pedestal that I never expected to reach.

But all joking aside, I want to say to you that those few words which were attributed by Mr. Galloway to the nurserymen, merely showed to you the position which he thinks the nurserymen hold among the fruit growers of California.

If it were not for the nurserymen, where would you get the fruit trees, where would you get the vines, where would you get the ornamental plants that have made California famous in the horticultural world? Who is it, if it is not the nurseryman, who brings these new plants? Who, by his desire to improve the fruits of his State, introduces new varieties? and in the doing of that, gentlemen, the time has arrived when he occasionally does introduce pests.

We want the advice of the horticultural commissioners to prevent us as far as it is possible from introducing these pests, which are such a menace to the fruit-growing interests—not only the fruit-growing interests, gentlemen, but the ornamental tree interests of this State. When we come to these fruit growers' conventions we talk nearly always about fruit, but do you know there are many things outside of fruit which attract to California?

There is no state in the Union, and I do not hesitate to say it now—no state in the Union will ever develop, not only the magnificent fruit, but the varieties and the assortment of shade trees and ornamental plants that California does.

The horticultural commissioners are, in a way, policemen, and I think that they should exercise that police duty in order to hold in check those men who would introduce pests and probably spread them far and wide were it not for the supervision that is exercised by the horticultural commissioners.

But I want to say to you, further, that I do not think that the horticultural commissioners should so take advantage of their position when they know a nurseryman is trying to do his duty, when they know a nurseryman is trying to eliminate pests, and is exercising every power he has to hold the pest in check that he knows is a detriment to the fruit growers of California, to run an ad in the paper and circulate a report about the condition of that nurseryman's trees. I tell you, nurserymen are citizens just as well as you are, and the fruit growers, and they are entitled to the same consideration that you would give to any other fruit grower or any other citizens of California. I have had these things; I know of what I speak, and I do get a little excited about a matter of that kind, because I tell you, gentlemen, you do not realize how far-reaching those things are; you do not realize it; and I want to say to you, the nurserymen of the State of California want to sustain you in your work. We want to encourage you in your work, because it is only by the supervision that you exercise that we will be able to continue in business.

Why is it that a nurseryman—I want to avoid personality as much as possible; I do not want to bring it up in this discussion if I can possibly avoid it; I know it is hard not to do it, because when I get up and make an excitable talk, I will have my friend Mr. Stabler or Mr. Pease say, "why do you get up and make such vigorous remarks? We never have occasion to condemn your stock." You know I am placed

in a rather unfortunate position. In a way I am regarded as a sort of a joke. I have been attending these conventions since my boyhood days in 1889, and I am getting on in years. You can notice that by the little hair there is on my head, and they all sort of know me. They call me George, and pat me on the back in a way, and I am good natured. I try to be, except occasionally, when I boil over. As I was saying, the nurserymen ought to have the proper encouragement to continue their work. You know, gentlemen, it is largely due to the fruit pests that are in this State that nurserymen have to move from one section to another in order to grow trees that are clean.

There is one problem, probably, that is a greater problem to the nurserymen than any other one, and that is, to find suitable land and find a location where we can grow trees without disseminating the very pests which you object to.

I have always in my remarks before conventions heretofore made very positive remarks, and have taken a very determined stand in reference to the matter of inspection. This matter in a way has come up this evening in reference to uniformity of laws. I do not wish to digress very much from the subject that has been assigned to me, for fear that you might apply the hook a little earlier than I would want you to do, but I want to say this, that I think the state law as it is framed now practically covers the ground, and if I had my own way about it, as a nurseryman, I would like to see all the ordinances passed by the supervisors in the various counties eliminated. I think, myself, that these laws are very often conflicting, and I think if we continue to have a few more of them I will have to take a course in a law school in order to keep in touch with them. I think that the law which absolutely prohibits the introduction, or, rather, the shipment of nursery stock from one county to another without inspection, is unconstitutional. We had such a law in Fresno County. A case was decided by a superior judge and the county paid the bill for burning up some stuff because they declared there was an imaginary line between certain counties, and wouldn't permit that stuff to come into the county. Nevertheless other counties have passed these laws. They claim they have a perfect right to do so, and the very fact that the board of supervisors is a legislative body gives them that right; I will admit, but nevertheless, this places the nurseryman in a very peculiar position, as I said before, simply because in those counties where they have these ordinances they absolutely prevent the shipment of his stock to another county without inspection.

MR. HICKMAN. Sometimes even with inspection.

MR. ROEDING. Yes, sometimes even with inspection; and I think that those laws should be changed to such an extent that we, as nurserymen, have no objection to inspection both before the stock is shipped and after it is shipped; in fact, I as a nurseryman think that that should be encouraged in every possible manner; but I do not think—as an illustration, that grapevines, because they happen to come from a county which is infested with phylloxera, should be absolutely prohibited, on the ground that you can not find the phylloxera when you look for it. Now, as an illustration of the lack of these uniform laws, I want to say that Mr. Cundiff in Riverside County permits a shipment of vines into Riverside County providing the horticultural commissioner of Fresno

County will make a statement that those vines were grown a certain number of miles from a district infested with phylloxera. On the other hand, Mr. Pease, in an adjoining county, through his supervisors, has an ordinance which absolutely prohibits the importation of vines from this county. Now, there is a conflict right in those two counties.

Mr. Galloway in his remarks also stated that it was not always possible for a man who was running a nursery business to watch all his employees, and that statement is absolutely correct. It is impossible. But I want to say that the nurseryman who is established in business, who has had years of training in his business, who has stayed with it through all its vicissitudes—his word, his desire to do right, should be considered by the horticultural commissioners in all their work; they should not condemn him without giving him an opportunity to be heard. I do not wish to ask the commissioners to extend any favors to the nurserymen outside of that to which they are entitled.

If there should be any stock infested with pests, I do not think any growers should plant it. I think that the stock should be destroyed. Because any man that is in the fruit business—and now I am going to place myself in the fruit business for a minute—realizes how much more serious an infested tree is to him than it is to the nurseryman. It is a terrible thing to have a fruit grower plant thousands of trees and after they have been put out, after he has bestowed all the care on them for several years, to find that they must be dug up and destroyed. It is just for those precautions that we want the horticultural commissioners to exercise their duties; but, as I have said before, we want them to give the nurserymen—those who are legitimately engaged in the business—a chance, and not condemn them without a hearing. There are very few nurserymen who have been in the business any length of time who do not, after they have been in the business a few years, also become fruit growers; and those nurserymen appreciate that it is absolutely necessary to properly inspect stock so as to prevent the introduction of pests from one district to another.

We have before us a gentleman whom you all recognize as one of the greatest horticulturalists in the world, and I dare say that it was largely due to the insight that he got into the plant world as a nurseryman that he has done the wonderful and exhaustive work he has done in the horticultural world; I refer to our friend, Luther Burbank. I thank you gentlemen. [Applause.]

MR. PEASE. As long as Mr. Roeding has paid his respects personally to me, I would like to answer his remarks. For everything that we do we claim to have a good reason. I presume that every one of you in this audience is well aware that we have a law which prohibits absolutely the importation of peach stock, known to be infested with peach yellow. It does not say that we should take the chance to find out whether it is infested. Again, we are quarantining against anything from Florida, because they have a lot of plants that might carry the white fly.

When I was at Hanford a gentleman who lived in the vicinity of Mr. Roeding in Fresno County read a paper on table grapes, and in that paper he recommended the people in that section of the country to plant the rows wide apart, so that in case they got the phylloxera introduced they might plant resistant stock in between.

We have in our county 20,000 acres of grapevines. We have not any phylloxera. The insect is a very small insect, and the average inspector would not be expected to catch a slight infection. If a man wants to ship nursery stock from a district where he knows the orchards are badly infested with purple scale, we quarantine against it; we do not take it. The same way, if they come from a district known to be badly infested with mealy bug. If a man wanted to ship trees from a district known to be infested with the rough mite, we do not take chances. The idea of the business is this: If we take chances on every pest we have not got, it is only a question of time when we will get them all, and we do not want them.

MR. WILSON (of Santa Clara). I would like to say a word as a nurseryman and as an orchardist, because I am a doctor that takes his own medicine, and I heartily agree and sympathize with Mr. Galloway's paper—it suits me to a dot; also Mr. Roeding has struck the keynote and voices the sentiment of most of the nurserymen. Another thing I think that will eliminate a great deal of trouble between the nurserymen and the growers is the fact that it is different now with the horticultural commissioners. They can come and exchange ideas. Now, the same with the nurseryman in our nursery association, both the Pacific coast and, now, the new one, Association of Nurserymen of California, and it is going to lead to a great deal of good. I think, as a rule, that the nurserymen appreciate the fact that they should be very careful and send out clean stock, and that their interest and the growers are almost identical. Of course, there are some among the nurserymen that are not particular how they grow their stock, how they get their seed, where they select it from, and consequently they do have diseased trees, and what they grow they want to get rid of. But with the coöperation of the nurserymen and the horticultural commissioners, both the grower and the nurserymen are safer. I thank you. [Applause.]

THE CHAIRMAN. Is there any one else?

MR. BANKS. I feel considerably like Mr. Roeding in regard to a man having a fair trial. I think that a nurseryman, if his trees are condemned, ought to have a hearing, in place of the commissioner absolutely destroying the trees. I think it is unfair for me to destroy your property without giving you a hearing for that property, because we are all in the same business. Mr. Roeding is a fruit grower, he says; I am a fruit grower, too; I grow a tree occasionally; and I would hate to send my trees over in his neighborhood, and have him destroy them without giving me any show to defend myself. [Applause.]

MR. GARDEN. There is a point in Mr. Roeding's remarks that I think all the county commissioners should consider, and that is, when the trees are found in bad condition, and not only trees, but when fruit comes in in bad condition into any county, and it is found in such a condition that it is necessary to condemn it, that publicity should not be given. I am very much opposed to that, and have prevented it as much as has been in my power, although a newspaper man gets hold of things, and we do not know how he got them. It injures that party and it does not help us in any way. I keep a strict record of all stock condemned, but the newspapers do not get hold of one per cent of the work that is done. Our work should be done as county commissioners, and accurate accounts kept of our doings and reports made as required by law; but as to any official, any inspector or commissioner, giving out that he has

found so and so come from Mr. Roeding's nursery, and it was condemned, does him a great injustice, and I think that before we finish our meeting here that we will have an understanding to that effect.

THE CHAIRMAN. We will now pass to the next subject, and Mr. Cundiff has discussed that to some extent, and I suppose he will not detain us very long in his remarks. It is "Desirability of Uniform Inspection Service for Intercounty Shipments of Nursery Stock."

QUARANTINE LAWS AND THEIR RELATION TO OUR HORTICULTURAL INTERESTS.

MR. CUNDIFF. I was notified several weeks ago by the president of the State Association of County Horticultural Commissioners that I had been assigned the subject, "Desirability of Uniform Inspection Service for Intercounty Shipment of Nursery Stock." Believing that this subject could not be profitably discussed or properly understood without a more or less extended reference to general inspection laws, both state and national, I obtained permission to change the title to read "Quarantine Laws and Their Relation to Our Horticultural Interests."

The writer has for a number of years contended that state and county quarantine and inspection laws will never be able to accomplish the best results in the way of benefits to these great interests until assisted by the enactment of suitable laws by the Federal Government bearing upon the same subject. I deem it unnecessary to enter into a prolonged discussion as to the benefits that would properly accrue to our horticultural and agricultural industries through federal legislation, as the subject has claimed more or less attention at nearly all of the fruit growers' conventions held in this State for the past dozen years. In addition, able articles advocating such legislation have from time to time appeared in many of our leading horticultural newspapers.

There has never been a period in the history of our country when the need for such legislation has been so urgent as at the present time. Many in this audience are doubtless aware of the many attempts, and I regret to say failures, in the past to secure a federal horticultural quarantine law. A brief history of some of these attempts and the causes for our failures to achieve success may not be amiss, and may possibly give some suggestions for future guidance.

So far as I am informed, the honor of drafting the first national horticultural bill belongs to my immediate predecessor in office, Mr. Felix G. Havens. This bill was prepared and presented to the first session of the fifty-sixth congress, December, 1899. Captain M. J. Daniels of Riverside, then representing our district, introduced the bill in the lower house and Senator Geo. C. Perkins introduced a concurrent bill in the senate. Through the active work of Mr. Havens, assisted by prominent horticulturists from all parts of the United States, twelve of our most prominent fruit growing states petitioned congress through their several legislatures to enact the bill. The bill also had the earnest approval of the Secretary of Agriculture, as well as the hearty indorsement and active assistance of Dr. L. O. Howard, Chief Entomologist of the Department of Agriculture. Many of the state horticultural societies, as well as prominent horticulturists from all over the United States, strongly indorsed the bill. Apparently no attempt was made by the opponents

of this measure to defeat it in committees, as both houses of congress reported the bill favorably.

The Hon. Mr. Haugen, a prominent horticulturist of Ohio, was the chairman of the committee on agriculture in the lower house, to which this bill was assigned. The report made by Representative Haugen for his committee in support of this bill contained some of the strongest arguments ever presented in support of any legislation. This report was ordered printed in full by congress, and from it I have taken the liberty to quote a few extracts, as follows: "The necessity for such legislation is of the gravest importance for the protection of our agricultural and horticultural industries. Scientific men and nurserymen have recommended it for years, and the demand for it upon the part of the people has become so strong that it should be deferred no longer. The pending bill has been indorsed by representative entomologists and vegetable pathologists, as well as by nurserymen and fruit growers. It is acknowledged that fully one half of the injurious pests now in the United States have been introduced from foreign countries. No effort has ever been made by the General Government to prohibit the entrance of such pests. The chief danger to the nursery interests of the country is that different states have passed different laws, many of them very drastic in character, practically prohibitory, so that an honest nurseryman is unable to send clean nursery stock into other states; while a dishonest man, or careless one, may freely send inferior stock to other states which have not yet protected themselves by state laws. These difficulties can only be reached by a law governing interstate commerce, such as is now proposed."

The above able arguments presented by Mr. Haugen in support of the first national quarantine bill presented to congress thirteen years ago certainly apply with an added emphasis to-day. The estimated damage from injurious insects and plant diseases to horticulture and agriculture, as compiled by careful entomologists, for the year in which this bill was presented is given at about \$300,000,000. According to the latest available reports, this damage has increased to about \$750,000,000 for the year 1910, or an average of about 100 per cent per decade. In the annual report of Secretary Wilson, presented to congress on the 15th of this month, I quote the following rather significant paragraphs: "Every country in the world that has diseased plants that can not be sold at home can ship them to us. This results in great loss." "We are sending explorers to the ends of the earth for new plants and getting them."

Our senators and representatives in congress all gave strong support to this first attempt at getting a federal law passed; especially were Representatives Daniels, Needham, and Watters untiring in their efforts to secure the passage of the bill, as was also Senator Perkins. It may appear strange that such meritorious legislation, so strongly indorsed from so many influential sources, should have been denied us. The reason for such failure, as well as similar attempts that have been made in subsequent sessions of congress, we believe may be summed up in the few words, lack of organization, or want of an organized effort upon the part of the horticulturists of the country. While this legislation had the almost unanimous indorsement of the nurserymen dealing in domestic stock, it was bitterly opposed by the National Nurserymen's Association, which at that time was composed largely of importers of foreign

nursery stock. This association had as a strong ally the association of fruit importers. These organizations, through their personal representatives, who were their most intelligent and influential members, were able to defeat the first bill as well as each measure that has since been introduced concerning this matter. We assume that no argument will be required to convince the California horticulturist or agriculturist of the imperative need of the immediate enactment of such a federal law. Aside from the aid such legislation would give us in preventing the introduction from foreign countries of new insect foes and plant diseases, the value that would accrue in regulating the movement of diseased or pest-ridden nursery stock, fruits, etc., in interstate shipments would be almost beyond our power to compute. At the present time one of the most dangerous factors in the dissemination of insect pests and plant diseases is through our postal service. This can be remedied only through the enactment of a federal law which would prohibit the transmission of such material as had not been properly inspected and vouched for by a competent horticultural official. The careful examination of baggage or other personal belongings should undergo a strict examination for specimens of fruits, plants, flowers, etc., that are liable to convey infection of above nature. These matters can only be successfully controlled through an adequate federal quarantine law. The recent discovery of the Mediterranean fruit fly in the Hawaiian Islands, acknowledged as the most destructive of all known fruit pests, the alfalfa beetle of Utah, the eelworm of the potato in Nevada, as well as other pests of less importance over other parts of the United States, should impel us to immediate action.

But for the rigid enforcement of the quarantine and inspection laws of this State by our State Horticultural Commissioner and his able assistants, the probabilities are that all of these new pests would have become established in this State during the present year, to add to the already heavy burdens of the fruit grower and farmer. It must be apparent to any thinking man that, however efficient our state laws may be, governing these matters, and however ably and conscientiously they are administered, it will be an exceedingly difficult, if not impossible task, to prevent for any considerable length of time the entrance of these destructive orchard and field pests that are already firmly established so near our border, without the intervention and assistance that can be had only through federal legislation. Though our state and county horticultural officials are ever on the alert to prevent such a catastrophe, our citrus fruit interests are in imminent danger of the introduction of the Morelos orange maggot from Mexico and the white fly from Florida and Louisiana. While the quarantine laws of our State prohibit the shipment into California of citrus fruits from Mexico or host plants of the white fly from the above-named states, we have no jurisdiction over the personal baggage of passengers arriving almost every day from these sections, or of any package coming through the United States mail.

During the past thirteen years I have been almost a regular attendant at our State fruit growers' meetings. I have also attended many farmers' institutes and other meetings representing horticultural and agricultural interests. At most of these meetings the need of a national horticultural quarantine law has come up in some form for discussion, usually ending by passing a set of resolutions indorsing such legisla-

tion, and the average fruit grower and farmer appears to think that this is all that is required to insure favorable action at the next session of congress. Such resolutions are of doubtful value unless supplemented by organized systematic effort. Any important legislation desired is likely to meet with opposition from some quarter. The past efforts at securing a federal quarantine law have proven no exception to this general rule. Powerful factors are financially interested in the defeat of such legislation. Such opposition is always organized and ready to give battle to the bitter end. Comparatively few of our representatives in congress are directly interested in horticultural or agricultural pursuits. Many members represent districts and states where agriculture and especially horticulture are of minor importance.

Such members must be educated as to the importance of our demands. This can be effectively done only by personal interviews with such members. The opponents are always on hand with their arguments against such legislation. The citrus fruit organizations of this State at the present time have some of their ablest and best posted men on guard at Washington to prevent a reduction in the tariff on their fruits. They find this to be absolutely necessary to offset the arguments made by the importers of foreign fruits who are financially interested in a low tariff upon the commodities which they handle.

California is the leading horticultural state in the Union and would naturally be expected to take the greatest interest in any federal legislation that will protect or promote her leading industry. A committee, composed of some of our leading and most influential horticulturists, who are thoroughly conversant with the aims, objects and benefits to be derived from the enactment of a federal quarantine law, should be in Washington at the present time to further the interests of such a law. A careful watch should be maintained that the opponents of such legislation are neither able to defeat such a law nor to nullify its benefits by changes or amendments.

During the past few years considerable discussion has arisen at some of the fruit growers' meetings, especially by the nurserymen, as to the desirability of a more uniform system of state and county laws governing the movement of nursery stock. I fully agree with the nurserymen that such laws should be enacted as would in all cases be fair to both nurserymen and fruit growers. These laws would necessarily, so far as the counties are concerned, have to be enacted by some system of mutual consent by the different boards of supervisors in counties where conditions are such as to require these special laws. To the supervisors is delegated by legislative enactment the right to enact and enforce such police, sanitary, health and other laws for the government of their respective counties as are not in conflict with the constitution of the State. In a decision of the supreme court of California, rendered a number of years ago, when the supervisors of a certain county had been attacked for enacting and enforcing certain horticultural ordinances, on the question of their constitutionality, their right to enact such laws was upheld.

The court upheld the ordinance on the ground that it was a reasonable attempt at regulation, coming under their right to enact police regulations. I am aware of the fact that our distinguished attorney general of this state has been quoted as giving his opinion that many of the

county ordinances relating especially to quarantine are unconstitutional. While this may be true in regard to horticultural ordinances in some counties, I am under the impression that many of the most beneficent ordinances, among which I will mention the right to refuse the entrance of nursery stock, fruits, etc., from any other county or district where destructive pests are established, is not in conflict with the state horticultural law, or any other law of California, and would be so upheld by the supreme court of the State. I do not believe it would be possible to safely trust so important a matter as the movement of nursery stock in California to any uniform set of inspection and quarantine laws. California is a large State and has a great diversity of productions, especially of fruits. What might constitute a serious pest in one county would not, perhaps, be so regarded in some other county where the varieties of fruit are entirely different.

I am aware of the fact that these regulations often appear to work a serious hardship upon our nurserymen, but I believe that without these special regulations in the form of county ordinances, great injury would, in many instances, be done to the orchardists.

Personally, I believe in the policy of keeping pests out of a county by quarantine regulations. While it is possible and often probable that the nurseryman who is so unfortunate as to have his nursery located in a district where serious fruit pests have become established, may have clean stock—there is always the possibility, if not probability, that some of the infection has found lodgment upon his nursery stock.

Many of the most serious orchard pests, especially of the citrus fruits, are very difficult to always locate by the most competent and careful inspector, they are also often very resistant to all known remedies for their destruction. Hence I regard it as the only safe method to refuse such stock entrance into any county from such infected district. Especially is this important if the county to which such shipments are sent is free from such pests. I know of no county or district where the above policy has been deviated from for any considerable length of time where these pests have not become established. The diverse and peculiar state quarantine and inspection laws in some of the eastern states, as well as an entire absence of any laws of this nature in other states are factors that would in my opinion prevent the best results in an attempt to secure a uniform set of county laws to control shipments of nursery stock. It is entirely probable that by the enactment of a federal law, absolutely controlling the movement of nursery stock through interstate shipments would come a more uniform set of state laws. This, we believe, would have a decided effect in eliminating some of the present county horticultural regulations which at present appear to be in conflict with the interests of the nurserymen. The interests of the orchardist and nurserymen should be equally conserved by the enactment of wise and judicious laws, national, state and county.

To the early consummation of such legislation the orchardists, farmers and nurserymen of this State should give their united support. [Applause.]

THE CHAIRMAN. I will now call upon Mr. A. L. Rutherford of Modesto, to open this discussion, and as the time is late it will depend on how interesting he is how long we will stay here.

MR. RUTHERFORD. I am certainly in favor of more uniform inspection rules for several reasons. For instance, there was a carload of apples came into our county a short time ago, and they were more or less infested with codling moth, and I demanded that they be shipped out of the county—first, to be burned or destroyed; and the man who had them in charge said he would take them to an adjoining county; they were not so particular there. If we had uniform inspection rules I would not know whether to let them go or not; as it was I let them go. In the case of inspecting eastern nursery stock, if we had a uniform rule as to how many trees infested with root gall in a shipment would justify in condemning the whole outfit, it would be quite a relief to a great many who in their minds are not fully determined as to whether they would be right in condemning the entire shipment for a few infested trees. So I am certainly in favor of more uniform inspection rules. [Applause.]

THE CHAIRMAN. Are there any more commissioners who want to talk on this subject?

PROFESSOR WOODWORTH. It occurs to me in this connection, while this law that has been discussed here to-night has been a long while going through Congress, another law that started a great deal later, runs past it to enactments, and the way that that was brought about was this—I refer to the excise law—when it was first introduced it found opposition. The opposition in that case came from the manufacturers and importers. The next step in the process was to include the manufacturers and importers in the committee, and the whole law was worked over, and with very slight amendments it was made acceptable to the manufacturer and dealer; and then it went right through congress in a thoroughly satisfactory way to all parties concerned without any addition. If the people that had been behind this law had taken the nurserymen and the importers into their committee and made a law that would be acceptable to those two parties—and they could have made a law that would have been acceptable to all parties, I have no doubt, because the nurserymen are certainly reasonable people, as we found the manufacturers and dealers in this excise case—there is no doubt it would have gone through congress long ago.

THE CHAIRMAN. These people in the south who are raising a great deal of citrus fruit actually believe that if we should import the white fly, and have it thoroughly established, it would be a serious menace to us and cost us thousands of dollars, and therefore we have got the quarantine against it, and yet it is found that they come in by mail all the time. I was somewhat surprised in coming up here on the train—my wife had put the magazine section of the *Los Angeles Times* in my suit case and I was reading it—when I turned over to one of the pages speaking upon this very subject, and the author had copied and inserted in his article testimonials taken from the circular or catalogue of a Florida nurseryman, and the very first thing I saw at the top was, "Your plants arrived in excellent condition." This was from Florida: "Your plants arrived in excellent condition and are growing finely—Orange County." That was the very first one on the list. There were others from Riverside and Los Angeles and Santa Barbara, and every other county in the south. No names and no towns were mentioned, the author having taken those testimonials from catalogues of the Florida

growers. Evidently those people had received by mail certain plants. I do not know what they were, and they had written back possibly to these people. Now, you see what an important thing it is to look after the mail, and I am not so sure that the little slips are not as dangerous as anything we could ship in here, and even more dangerous than that we would get directly from the nurserymen, because that package may be picked by anybody from his garden and shipped to some friend, they knowing nothing about the danger. I would like very much to see a regulation by which we could control the mail shipments.

Are there any other remarks upon this subject? If not, we will have to stand adjourned until to-morrow evening, as far as our association is concerned.

THIRD DAY—MORNING SESSION.

THE CHAIRMAN. Half past nine; that is the time set for the opening of the meeting. Is our music prepared to entertain us? Anybody here prepared to give us music? Maybe they will come a little later. Is the Reverend Mr. White present?

(After an invocation by the Rev. W. G. White of Santa Rosa, the proceedings continued as follows):

THE CHAIRMAN. It is perhaps not quite the thing to do to commence our session with so few here—that is, the regular program, and some other things ought to be discussed. One of the things of importance is the matter of the next meeting. It is the custom to hold two meetings a year, one in the winter and one in the late spring. Now is the time to consider that subject, where we shall go for next year. It seems to me that we should treat everybody alike, and we ought to have the thought of these meetings going to the different sections of the State. It seems to me that would be the fair thing. And the matter should be considered that we want to go to a place that wants us. Three places have asked for the meeting, one at San Bernardino. The last meeting was there, so that they do not seem to have any claim for a meeting. Hanford of Kings County has also presented a claim, and I have in my hand their application, and Santa Barbara, through Mr. Beers. I am sorry Mr. Beers is not present. Hanford would be in the center part of the State, and perhaps from locality they would have quite a claim. I would like to hear some others in regard to the matter. This is a pretty important matter, I think. Now, this is before you. Is there anybody else to speak for Fresno?

MR. SHARP. I would like to say in addition to those petitions and the editorial comments in regard to the matter: It has been eight years since we have had the privilege of entertaining this body in our county. Our county, as you know, is comparatively new, but we are very nicely located as far as accommodations are concerned. Both the main railway lines of the State run through our city and we have abundant hotel accommodations, and we think we can show you some of the finest vineyards and orchards that are to be found in the San Joaquin Valley. While I am sorry that we have not more of our county people here, we realize the fact that this is a very busy time of year with orchardists, and this place is a little bit difficult to get to from our part of the country, so they left the matter entirely to me. I brought the matter up a year ago. We are very anxious to have the convention with us. Some of you perhaps remember the last convention you had there, and we know we can make the coming convention much more interesting and profitable to you, and we feel that we need your help perhaps as much or more than any other county in the State. As I said before, our county being a new county, and our people being a home-loving and working people, we need your help to increase enthusiasm; and I promise you will be well entertained, and when you leave Hanford, you will feel it has been profitable for you to come there.

MR. BEERS. I came up here with the Chamber of Commerce in my pocket, with the county board of supervisors very harmonious and delightfully expectant that you would come with me to Santa Barbara

next year, and I want to extend our invitation to you. We have a beautiful place for a convention. We have abundance of accommodations for all your friends and yourselves, and we will see that you are well cared for in Santa Barbara. You remember last year we talked about this, and we were pretty near a unit that we would go to Santa Barbara this year, and we gave away to Santa Rosa. We will be delighted to have you come down with us to Santa Barbara County. I do not need to tell you all the wonders of the county. We have splendid accommodations, both at the hotels and everywhere, and we will make the rates at your hotel so that you can afford to bring your families along. Have your folks there, and you will be just as nicely fixed as at home. We certainly invite you with all our heart to come to Santa Barbara next year. You will see what we can show you of our citrus groves and our apple orchards, and the fruits and grains and other crops that we raise in Santa Barbara County.

THE CHAIRMAN. I think you are laboring under a wrong impression. It will be the spring or summer meeting.

MR. BEERS. Well, the spring is delightful. We are always on the lookout in the greeting of the stranger. We appreciate the stranger in Santa Barbara.

MR. ROEDING. I did not intend to say anything, but in view of the fact that Mr. Phillips, who is the president of the Chamber of Commerce of Fresno County, is not here. He intended, as I know, to invite the delegates of the Fruit Growers' Convention to Fresno; and as he is not present, I will take it upon my shoulders to say a few words in behalf of Fresno. Now, I do not care to speak further in this matter, if it is the intention of having a semi-annual meeting, and as I understand it from Professor Cook that meeting will be held in the summer time—because, while I thrive under the suns of Fresno, as you will notice, and under the hammerings I receive from the horticultural commissioners, nevertheless I do not think that Fresno would be the place for you to come to in the summer months.

I am going to take advantage at this time of presenting Fresno to you as the place for the next annual meeting. I think Fresno to-day is the greatest fruit-growing section in California. We have a very progressive town. We have a country and drives that even people from Riverside concede far outdo their wonderful drives in Riverside. You who have never been in Fresno have little realization of the wonderful strides that have been made there in horticulture and viticulture, and in addition to that we have a number of hotels. There is a new hotel being constructed there, a fireproof hotel, which I am quite sure will be ready to receive you if you hold your meeting there next fall.

Further than this, Fresno has not had this convention for, I think, something like ten or twelve years, and it is about time that the central part of the State is properly remembered. I do not wish to say anything against Hanford, except that Hanford has had the convention since Fresno has had it. I only feel that Fresno, being located as it is, being to-day the leading city of the San Joaquin Valley, is entitled to have the next convention—that is, the next annual convention, and I hope, gentlemen, you will give it your careful consideration.

THE CHAIRMAN. Are there any other persons that wish to invite the convention, which will occur sometime in the spring or the summer?

MR. BEERS (from Santa Barbara). If they ever had a state con-

vention in Santa Barbara it must have been before my birth; I do not remember having attended it. On that plea we certainly need the convention down there to waken us up again. We need your presence to keep us going and to stir us up. We can drive out to a citrus convention occasionally, but I found it quite difficult to bring any of our people up here. We need the convention down there to save those people. We are not going to skin out and be fussy as to whether you are going to come summer or winter. We are like the schoolteacher who was asked whether she taught that the earth was round, or that the earth was flat, and she said, "I can teach you either."

THE CHAIRMAN. Are you ready to vote, then? You remember, we have an invitation to Hanford in Kings County, we have an invitation to Santa Barbara in Santa Barbara County; I think the one from San Bernardino is withdrawn. Am I right, Mr. Pease?

MR. PEASE. As long as we had it a year ago, we do not stand very high for the next meeting.

THE CHAIRMAN. Are you ready to vote? I think the best way would be by show of hands. All in favor of Hanford will raise their hands. All in favor of Santa Barbara will raise their hands. Santa Barbara seems to have it.

MR. ROEDING. Will you take up the matter of voting on the annual meeting now?

THE CHAIRMAN. Wouldn't that be a little previous?

MR. ROEDING. This is an annual meeting; why not consider the next annual meeting right now?

THE CHAIRMAN. This convention has the matter in their hands.

MR. ROEDING. I make a motion that the consideration of the next annual meeting be taken up now.

MR. ———. I second the motion.

THE CHAIRMAN. You have heard the motion. All in favor of the motion say aye; those opposed say no. The motion prevails.

MR. SHAW. I hope you can consider, then, that our petition is for the next annual meeting—Hanford.

THE CHAIRMAN. We now have the question before us of the next annual meeting. Mr. Roeding has made an eloquent plea for Fresno.

MR. VOLCK. I wish to make the statement that Kern County is going to figure very largely in the production of fruit and vines and is going to rival Fresno by that time, and it would be well to take into consideration Bakersfield, with all the accommodations.

THE CHAIRMAN. This is a little dangerous. I am very much afraid if we decide this now the meeting at Santa Barbara may decide otherwise, and they would have a right to, I should think. Certainly, as a feeler, there is no harm in it.

MR. STABLER. The vote is always advisory. It has always been the custom to vote on a place before the next annual meeting, so I think it is quite in order to vote at this time. My experience has extended over a longer time than any other member here probably, as my first meeting was in 1887, and I have attended four annual meetings since. So I know the rule has been to select a place at each meeting. Personally, I hope very much that we will decide to go to Fresno. As Mr. Roeding has so well said, it is one of the very largest fruit centers of the State, and it is very accessible for the north and south. It is a

sort of meeting place, as it were; and then again there is a great deal for a fruit grower or a horticultural commissioner to learn in Fresno, and it is quite possible to find out whether what Mr. Roeding has been telling us is the truth, and give us an opportunity to see how he grows his trees; and I feel it will be an advantage for the county commissioners to hold their next annual meeting in Fresno, and give us an opportunity to check up Mr. Roeding.

THE CHAIRMAN. We have, then, the invitation for two places, Hanford and Fresno, for the annual meeting. All in favor of Hanford for the annual meeting will please raise their hands. All in favor of Fresno. Fresno evidently has the majority vote.

MR. WOODWORTH. I want to put a name opposite the date of 1915—Berkeley.

THE CHAIRMAN. You would not ask for a vote to-day, would you, Professor? We will all bear that in mind surely, because we would all like to go to Berkeley.

There is another matter that is pressing, and perhaps we will not have a better time to consider it than now, and that is the matter of the national quarantine law; and certainly we would not wish to adjourn without putting ourselves on record. Somebody spoke to me this morning and asked me to bring it up. I believe it was Mr. Stephens.

MR. STEPHENS. That is a very important matter, yes, sir.

MR. BEERS. Your committee on resolutions has been handed a formal resolution on the matter, and if you would take up the matter a little later—

THE CHAIRMAN. Perhaps I owe you an apology for bringing it up?

MR. BEERS. I think we have in our hands a carefully prepared resolution covering the ground, that will give you a splendid opportunity to discuss and arrive at the proper solution.

THE CHAIRMAN. We will just defer it then and take it up in connection with the resolution.

MR. STABLER. I would like to ask the chairman of the committee on resolutions if it does not cover an amendment and not the national law.

THE CHAIRMAN. I think there are two important amendments to be considered in reference to it.

MR. STABLER. I believe there are some gentlemen here who would like to see the matter discussed, and I think it would be opportune. I know one gentleman has stayed over to be present when the matter was brought up.

THE CHAIRMAN. Mr. Stabler, I think that is a good suggestion. We will take a little time for it. We would like to have you speak on that matter of the national quarantine law.

MR. STABLER. I am not in the position to speak on the law like Mr. Roeding and Mr. Stephens, and I would like to ask Mr. Roeding or Mr. Stephens to speak on it.

MR. BISHOP. I was going to request that the resolution committee present that resolution at this time, because there are certain parties that have stayed here to aid us in this matter.

THE CHAIRMAN. If there is no objection we will have that resolution read now.

MR. BEERS. The committee will be very glad to submit the resolution. It reads as follows (reads):

WHEREAS, There is now pending before congress Senate Bill No. 2870, and House of Representatives Bill No. 12,311, pertaining to a national quarantine of plants; therefore, be it

Resolved, That the Fortieth California State Fruit Growers' Convention, assembled in Santa Rosa, California, December 21, 1911, does sanction the provisions of said measure with the following amendments, to wit:

A provision which will allow the proper authorities in California to inspect all mail shipments of trees, plants, fruits, seeds, scions, buds, grafts, bulbs and flowers coming into the State, and also the baggage of travelers. And we request our legislature, now in session, to memorialize congress, urging the passage of the bills.

THE CHAIRMAN. This resolution has been read. What is your pleasure in regard to the resolution?

MR. STABLER. It is simply proposing amendments to the national quarantine law. This is, of course, supplementary.

THE CHAIRMAN. Will you not prepare a resolution in reference to the law itself?

MR. STABLER. I will be very glad to do so.

THE CHAIRMAN. Mr. Pease, have you a word to say on this subject?

MR. PEASE. I have not prepared anything, but I know Mr. Roeding has.

MR. ROEDING. Mr. Chairman, I want to say that at a recent meeting of the California Association of Nurserymen at Los Angeles this matter was brought up; it was brought up by me. I happened to be a member of the American Association of Nurserymen, and although I am a member of that association, I do not approve of the methods which they have adopted to defeat legislation in this direction. That was one of my reasons for bringing this matter up before the California Association of Nurserymen. I wanted the California Association of Nurserymen to indorse the efforts that were being brought about to protect the great fruit interests of the United States, and not only the United States, but this State, which to-day is the greatest fruit-growing state in the Union. Before going into details in this matter further, I want to show you the position which the California Association of Nurserymen have taken in this matter, and then I will go on further. This is from the committee; I was chairman of that committee (reads).

MR. ROEDING (continuing). Now, I want to say, and I do not know that it is necessary for me to go very much into detail, that California, more than any other state, is probably interested in this proposition. We have been trying for a number of years to find some effective means of controlling the introduction of pests, many of which we have already heard about from experts at this convention; and now we have an opportunity of enlisting in our favor the National Government; and I will tell you, gentlemen, although the American Association says—and I have read the report—that it would not trust such men as Dr. Howard—I happen to know Dr. Howard personally, and I do not think there is a fairer and more honorable man in the United States in matters of this kind [applause.] And furthermore, as an entomologist, he stands supreme in the United States; he is not only recognized in the United States, but by foreign governments, and he often goes over there to solve problems for them. Look at our orange industry as an illustration. Last year we shipped 50,000 carloads of

oranges. Gentlemen, you are all aware what a terrible pest the cottony cushion scale was. You all knew and you all appreciated that the orange industry was wiped out of existence. What will happen to the orange industry if the pest from Mexico is introduced; why, gentlemen, it is too sad a thing to think of. Every precaution that can be devised ought to be taken to prevent the introduction of this terrible pest. You have all heard a detailed report about the danger of introducing the Australian fruit fly, that will not only attack the orange, but all our other fruit; so I say that while we have this opportunity of getting the National Government to take up this matter, not only to take up this matter, but to lay out a set of plans, that we can not use too strong a plea to show that California is in favor of the National Government taking this matter in their hands and exercising every power which they have to take care of our fruit industry.

THE CHAIRMAN. Anybody else wish to speak upon the subject? What do you propose then, Mr. Roeding, for our action?

MR. ROEDING. That the fruit growers here assembled indorse this bill.

THE CHAIRMAN. And that the Commissioner shall forward the resolution?

MR. ROEDING. I am going to say this—that is quite evident—I have a letter from Dr. Howard which I am not at liberty to make public—that the American Association of Nurserymen are again going to oppose this bill. A number of the commissioners at an informal meeting the other evening were fully aware of the contents of this bill, and I feel, in view of the great importance of this matter, to the fruit industry of California, that the fruit growers deem it proper, in order to bring this matter before our representatives in the proper light—that the proper thing to do is not to resolute, but to send some men who will act and who will present the matter, and, if necessary, show the American Association that they can not prevent legislation any longer.

MR. STEPHENS. Mr. Roeding refers to a bill. I would like to ask Mr. Roeding if his present phraseology is accepted?

MR. ROEDING. With the proposed amendment offered by Mr. Beers.

MR. STEPHENS. The amendments are included in the report of the committee; in other words, I want to find out whether it is satisfactory to you and the members of this convention of the Fruit Growers of California, whether the situation is such that this convention can vote intelligently upon the question, if everything has been done that is necessary to be done in order to accomplish the things which you contend should be accomplished. If so, it is proper to go to a vote immediately. If it is not, you had better qualify the action in such a way as to make it positive. This is the reason why I ask whether the bill at present, together with the amendments proposed, is satisfactory. If so, we are ready to vote.

MR. ROEDING. Mr. Stephens, I believe many of the members here know the contents of this bill, because there were at least twenty-five or thirty at an informal meeting held at the hotel the other evening and the bill was gone through and adjusted.

MR. STEPHENS. That is satisfactory. All I want to know is whether it is in proper shape.

THE CHAIRMAN. I would like to have a few who are present say a few words?

MR. STABLER. I was also present at the meeting and heard the bill read, and it was discussed, and personally I rather objected to the tremendous power the bill gives to the Secretary of Agriculture; but I was absolutely overruled by every one else at the meeting, who thought the power was not too great, and so I am in favor of the bill. Outside of that we all thought the bill was very necessary with the incorporation of the amendment which the committee on resolutions has read.

MR. STEPHENS. Then, I move the adoption of whatever action is necessary to endorse the bill.

MR. _____. I second the motion.

PROFESSOR WOODWORTH. I wonder really how many of the growers have ever seen the bill? I would like to see a show of hands, how many have ever seen this bill?

THE CHAIRMAN. How many of the growers have seen the bill?

PROFESSOR WOODWORTH. The point I want to make is this: I think it is very desirable, whenever we take an action, that we take it with all the information clearly before us, so that we know exactly what we are aiming at. Now, if we send this resolution forward, or send a man forward to push the bill, he may not go forward in a position where he can say, I have had this bill endorsed by people that have read it and know it, and stand for it, and it represents careful study. Evidently the law before congress is not satisfactory, otherwise we would not have two very fundamental amendments proposed. Perhaps we do not understand the meaning of those amendments; perhaps that had better be gone into a little more thoroughly, so that we can know exactly what it means. One thing I notice in the amendment is that personal baggage should be inspected. A good many of us have traveled in Europe and know what it is to have baggage inspected at each town. Will the people of the United States stand for that? Are we going to stand for something that we surely will lose on, because there are lots of other interests besides ours? We ought to consider those things very thoroughly. Is it going to establish a system of inspectors comparable with the system of custom house inspections in Europe? Another thing we ought to clearly understand—I am not talking for or against; I am just talking to get information, get light—do we understand—the matter was brought clearly to my attention because of my connection with the excise work this year—that really, according to the constitution of the United States, no state can legislate about the interstate trade; that is a matter that the United States must handle. Heretofore we have been permitted by simply overlooking the matter to control our own interests as regards the importation of nursery stock and other things into California. If this law is enacted, all of that work, every bit of the relationship, every bit of the work upon interstate shipments, everything that has to do with getting things into California, is going to be handled by the United States Department of Agriculture. Has that law given as great safeguards as we have now, when we are working under this unconstitutional, still, effective, system of inspection? Ought we not better instead of endorsing it outright, have the thing referred to a committee that shall refer it back to us,—a special committee, to consider it, and give us the actual information, so that when we act upon it we do not simply act upon what that committee recommends, yes or no, but that we shall know exactly what they are asking

for, and we will be ready to stand for it and know that we want that thing.

MR. STEPHENS. I am very glad that Professor Woodworth raised that question. I think that whatever action this convention takes should be understood by federal authorities and by members of congress, that the members thoroughly understand exactly what they are doing. If there is any one thing essential in this proposed bill, it would be authorizing the investigation and searching of baggage. It would not make any difference to us whether the pernicious parasites and particularly the Mediterranean fly so-called comes into California through nursery stock or through some peach or plum or something that is brought in baggage, the result to the State of California would be the same; and there is no use doing things halfway, and I think that is one of the essential things, just as much essential and necessary as it is to examine nursery stock; because it does not make a particle of difference to you whether this fly or other pernicious insects gets into California through baggage or through nursery stock, and I am very glad the Professor has laid the point, in order that our representative, if one goes to Washington, can say that the question was thoroughly discussed, and the fruit growers thoroughly understood what they were doing. I think it will be a very strong and forcible argument.

MR. ASHLEY. In regard to one point the Professor spoke about, in regard to inspection of baggage, I think the inspection by the Government would have a tendency to leave out as much of the inspection that he objects to in Europe. If it is inspected by the Government, and California thinks that the inspection is all right, wouldn't California have a tendency to accept the Government inspection without reinspecting it by the state or county? I think it would have a tendency that way.

MR. STUART (of San Diego). I agree heartily with everything the Professor has said except referring this thing to a committee. Now, the horticultural commissioners or associations have met and are here and they will probably meet again in about a year. Now, the more endorsements that you get from different bodies behind any bill the better off you are. If this is referred to a committee and it is referred back a year from now from that committee to the Commissioners' Association, in the mean time something is liable to happen to that bill, and our endorsement—why, we might as well hold it. And in that line. I think that we should get all the endorsement that we can, the endorsement of the Nursery Association as soon as possible. We can not do it here. If we here get the endorsement of the Commissioners' Association, and the endorsement of this Fruit Growers' Convention here, that is two of them that we know we can get right here. We ought to get them. Then those are ready to go before congress at any time. Then, if we can get any more than that along the Professor's lines, of course, we would be very glad to have them. But I do not think we should overlook the endorsement of both these bodies here at the present time.

THE CHAIRMAN. I regret to say that I have a telegram from Mr. Chase saying that he was delayed on the train and will not be able to get here until 10:30; so we will have to pass to the next paper, "Apple Culture," by Mr. C. E. Hotle of Sebastopol. Mr. Hotle is not here. Will Mr. Stabler be kind enough to read the third paper on the program, "California Nurseries," by Frederick Maskew of Los Angeles.

MR. STABLER (reads).

CALIFORNIA NURSERIES.

Mr. Chairman, Ladies and Gentlemen: The following statements have been put together for the purpose of furnishing those in attendance at this convention with an outline of what the State Commissioner of Horticulture is doing to protect the crop-producers of the State of California from any further reduction of the net profits of their industries, as a possible result of the ravages of insect pests and plant diseases that may be introduced on the imports of horticultural products that are daily seeking an entrance into various parts of the State. For nearly twenty years the quarantine division at the port of San Francisco has done yeoman service in this matter at that particular point, and has accomplished a great deal more good than it ever received credit for, not alone in the insect pests and plant diseases it kept out, but in the fact that it set a persistent example in the matter and kept prominently to the front the value and the necessity of such work on a broader, more general scale throughout the entire country. With legislation in sympathy with its purposes, it has at last been able to branch out and extend its sphere of usefulness. A division has been created for southern California with a fairly adequate force, and it is of this, its work and intended purposes that this paper has to deal.

The quarantine work in California south of Tehachapi, embracing the ten southern counties with the six busy maritime ports on its coast line, has been placed under the immediate supervision of the writer, with two inspectors to assist in the work. In view of the fact that in addition to these ports, at which vessels from all quarters of the navigable globe arrived in endless succession, there are three great railroad systems traversing this territory with distributing points almost innumerable, it would at first thought appear farcical to expect three men to intercept and examine all shipments of horticultural products seeking an entrance into such an extended area. Fortunately, however, the efforts of these officers are augmented by the intelligent coöperation of the State Quarantine Guardians. With the exception of San Luis Obispo County, each of the southern counties has in its county horticultural commissioner and his inspectors a corps of duly appointed officers, who have full authority to enforce the provisions of the state horticultural quarantine law, and to their credit be it said they are in most instances diligently doing the same. There is another factor that enters into this equation of intercepting imports—an important one—and as fruit growers are often plant buyers, it may be well for them to listen to it. The agents of the transportation companies are complying with the requirements of the state law in this matter more cheerfully than ever before. They, like all of us, are human, and when the prompt appearance of a horticultural quarantine officer relieves them from the necessity of listening to the gratuitous remarks of an angry consignee, as to his opinions in general of a corporation that will not permit a patron, even after paying the freight bill, to take away his package of trees, and also the pests that may be attached to them, the agent's respect for the law and a desire to see it enforced are correspondingly increased and the crop producers of California have all unconsciously enlisted the services of another agent voluntarily pledged to do his full share towards protecting their interests in this matter. This is good business;

it is tightening the quarantine lines in out-of-the-way places; we propose to cater to it, to foster and encourage this interest by every means in our power, until we will feel assured that every express office in southern California is nominally a horticultural quarantine station.

The actual work of the state quarantine officers in southern California at the present time is divided practically as follows: At the port of San Diego, Avery S. Hoyt is the inspector in charge. The principal work at that point consists of inspecting the imports and preventing the landing by passengers and crews of any contraband fruit, or infested plants or other horticultural products. There are about nineteen vessels arriving each month at the port of San Diego from outside the state lines. Several of these come direct from Mexican ports, and the passengers invariably—as the writer knows from individual experience—bring varied assortments of the tropical fruits of Mexico. The volume of these imports is very meager, but in that very fact lies the danger; large consignments, commercial shipments, carload lots, are invariably heralded by sufficient advance information so as to enable the quarantine officer to be prepared to accord to them all the care and inspection needed. It is probably true that of all the insect pests we are compelled to fight in California at the present time, and which are taking a million of dollars annually from the profits of crop production, but one species arrived here on a strictly commercial shipment of plants, and even that one would have been denied admission had the advice and efforts of the local officers been heeded or seconded at the time. It is with a full knowledge of these facts that I consider the minute detail work of the San Diego quarantine inspector second to none in the matter of its importance.

At Los Angeles is situated the main office of the quarantine division of southern California, and from there at the present time is also directed and carried on the inspection of all horticultural products arriving at San Pedro by sea from points outside the state lines. This is destined to develop into an important phase of the work in the very near future. At the present time there are three vessels a week from Pacific coast ports, one vessel a month from Mexican way ports, regular traders from Panama with no fixed dates, and tramp steamers from all over the globe. These must all be met on their arrival if a quarantine is to be maintained.

In conducting this work at Los Angeles I have the efficient assistance of Quarantine Inspector C. H. Vary; in fact, the larger part of the inspection at this point falls to his share. The extent and volume to which the imports of horticultural products arriving at Los Angeles have grown would both surprise and astonish any one who has not given this matter careful consideration. As the distributing point for an area of unparalleled intensive horticultural development, in which are to be found growing in luxuriance a larger, more diversified variety of botanical species than in perhaps any other similar area of like extent on the face of the globe, Los Angeles imports more ornamental trees, shrubs, and plants from outside the state boundaries than all the remainder of California put together. From Europe, the home of the gypsy moth; from Japan, a favorite haunt of the worst peach pest yet recorded; from Utah, where the alfalfa weevil is making an unenviable record, they have been coming by the carload since we took charge; from prac-

tically all eastern points—even Florida—express packages are a daily occurrence, and one of the regular daily points of inspection is the baskets of tropical fruit arriving by express from Mexico. To intercept and examine this volume of material with despatch; to give full consideration to the equity of every phase of the situation, and to leave behind in each instance a feeling that the action taken was solely for the future welfare of the State of California, calls for a full measure of diligence, tact and sound judgment on the part of those intrusted with this work. We are systematizing this work as rapidly as possible, and the most pleasant feature so far met with is the apparently increasing spirit of deference, respect and coöperation we are experiencing on the part of all those with whom we have dealings.

We would not have it inferred from what has been said that this matter of horticultural quarantine in southern California is complete and perfect. We who are daily doing the work realize that it is far from it, still we believe that it is planned along lines that will eventually make it as near so as possible. A great many details remain to be worked out and simplified, and this paper is sent merely as evidence to these assembled fruit growers that their agents in the southern part of the State are diligently pursuing the purposes and performing the duties to which they were assigned.

THE CHAIRMAN. Is Mr. Stuart in the room, Commissioner Stuart of San Diego? I am sorry he is not here, because he is acquainted with this work, and I think he would be very glad to speak about it. Is there anybody else that would like to comment upon this paper? If not, we will pass to the next.

MR. ROEDING. I only want to add a few words. That paper of Mr. Maskew simply demonstrates what I have been always saying of the necessity for a national quarantine law; that paper demonstrates that more emphatically than any other paper I have read, because Mr. Maskew and Mr. Wood, who was the quarantine officer prior to the time Mr. Maskew has been, has repeatedly shown me ornamental trees and fruit trees harboring a half dozen different kinds of scale.

THE CHAIRMAN. We will next take up the matter which our friend, Mr. Stephens, wishes to present here, and that is this matter of transportation. [Applause.]

MR. STEPHENS. *Mr. Chairman, Ladies and Gentlemen:* I propose to be as brief as possible, taking into consideration the magnitude and importance of this question. Your committee on transportation or freight rates has published, has printed, the action which it has taken subsequent to the last meeting. To read this whole thing would take some time, and then many of you would be in doubt as to what is stated. This is something that you can take home with you. You can read it, and I would like to have every delegate in this convention give it careful consideration, because if they will do so, they will gain much information regarding one of the most important matters relating to their interests, which is transportation. As I stated, I will be as brief in my remarks as possible; but in order to be formal in presenting this report I will say (reads).

Our committee has been in almost continuous correspondence, not only with the Pacific coast traffic officials of our initial railroads, but also with traffic managers and other prominent officials of all connect-

ing lines that handle California fruit shipments, since the adjournment of the last state convention at Stockton. There was never a time when opportunity offered that the committee did not press to the full limit the cause of the deciduous growers for more seasonable and better transportation facilities, such as for years have been given to the citrus growers. Every request and demand made by our committee was supported by data filed with railroad officials, which proved beyond the possibility of a doubt that they were but just and equitable.

The raising of the minimum on carload lots on deciduous fruit shipments from 24,000 to 26,000 pounds has resulted most disastrously to the interests of the growers in many ways.

First—It increased the percentage of decay.

Second—The additional weight caused a heavy increase in broken packages, which necessarily impaired the value of the whole carload, because of the damage done to a larger percentage of "near" broken packages.

Third—And the most damaging of all is the fact that it is an absolute barrier to the broadening of distribution by preventing the opening up of new markets for carload lots, which must be done to make it possible to market at a profit the rapidly increasing output of our deciduous shipments.

By careful reading and study of this report you get a very clear and thorough understanding of the question discussed by our committee and the railroad officials.

Before I close I desire to call your attention to a few important things as follows:

I will state that on June 22d, after making a summer trip to San Francisco to interview the Pacific coast traffic managers, that they consented to a meeting in Sacramento with independent shippers, with fruit growers, with grower representatives and fruit growers' organizations, etc., to consider this 26,000-pound minimum. We met there and discussed it, and you will find—in order to obviate the necessity of showing you what was done there and done previous to that—you will find that the independent shippers, that the growers and growers' associations had representatives there; you will find that they were communicated with by our committee, and you will find there the most important and positive reasons why the 26,000-pound minimum has worked havoc so far as the financial interests of the grower are concerned. You will also find that on July 6th, while the results of that meeting were not satisfactory, our committee kept firing in to the traffic managers on this coast the importance of a reduction in this minimum, and they suggested that we have another meeting, that while you will find in the correspondence there that they had practically passed upon the question, they were willing to concede another meeting. We held that on the 6th of July. Of course, after that the time was limited and too late to further do anything except to take it before the Interstate Commerce Commission. You will find in this report that our committee did not go to sleep at all. As quickly as it was announced that the minimum was increased to 26,000 pounds, our committee sent a telegram to the Interstate Commerce Commission protesting against that increase. You will also find, in the report, the reply of Judson C. Clements, who is chairman of the Interstate Commerce Commission,

stating that they had not been notified or received any notice that the minimum had been raised, and it would be necessary in order to protest to find out when the rate was published; and you understand after thirty days, unless you protest within that thirty days, why, then, the rate goes into effect. You will find all that in this report. So that there was no opportunity of pressing the claims of you gentlemen. I believe that the 26,000-pound minimum is the most serious obstruction and barrier to placing, particularly, the table grape growing interests upon a paying basis. You will find also in this report—I just simply desire to call your attention to some of the pages, and if you will note them down in your mind or otherwise with pencil, why, you can probably get some information that will be beneficial. First, is this pink sheet. It is like every one else, if you have any printing done, you have to be there yourself or there will be errors. I kept as close to this as I could, and yet in putting up the forms they made errors which this pink sheet will explain; and also you will find on this pink sheet a statement of shipments and sales of carload lots in different cities, which is an important thing and probably will give you information of value. The next is page 14; and on pages 11 and 12 you will find this correspondence I refer to regarding the Interstate Commerce Commission. On page 12, the 26,000-pound minimum, and below the signature of the committee is where a part of this pink page should have been placed. Now, the statistics given here are absolutely correct; as far as the sales are concerned, they are correct. You will find on page 22 a statement showing the sales of crops in sixteen auction markets. You will find the average given in the different cities; you will find a number of cars—for instance, to show you, in New York there are 276 cars and those sales were made between the 5th of September and the 29th; now, the 276 cars—the average on those was \$926. In Boston 123 cars averaged \$960; Chicago 105, average \$802, and so on down. Now, there is another table here that is important, showing the sales of different fruit and the averages in the different markets. This is August 17th to August 25th, which covers principally fruit and the pioneer shipment of table grapes, which brought enormous prices; for instance, some of the cars in these tabulations brought 1,990, some 1,500, some 1,600, and so on down to the losing point. I simply make those statements to show it is not garbled, that the report of every car that I could get hold of is tabulated with the figure of how much it brought; in other words, we did not select a low car, but we took everything in order to be fair. That is on page 22 at the top. In some instances, for instance, in Buffalo, twelve cars at \$687. The average of the whole lot was \$826. In order to get that average there must have been some of these cars, which, as a matter of fact, brought five and six hundred dollars, when the cars that brought 1,900 and 1,600 and 1,500 were included. In this you ought to get the information you desire; and that is the reason I am calling your attention to these things.

As I said, as a matter of fact, the table grape interest is most affected by our rates. I wish to say, also, that they lowered the rates and gave us what we asked for, a \$1.15 rate, but when they lowered that rate they raised the minimum; and I showed it to the railroad officials—which they admitted—that it was more money to the railroad, more net profit to them, and consequently a financial advantage and of financial

interest to them that by lowering the rate and raising the minimum they make more money, because the only difference in the carload lot to Eastern points was \$1; under the old rate they received \$300 and under the new rate they received \$299 freight. They admitted to me it was an advantage, but they said, "Mr. Stephens, do you object to our making money?" And I said, "Certainly not." Then I called attention to our correspondence, that we never had demanded that we should do business at a loss, but that what the growers wanted was at least a small part of the profits that we made out of the horticultural interests in California. It was their capital, it was their energy, and they were delivering it to the railroad and the tonnage was a vast amount, and that the rapidly increasing output of California deciduous freight was a source of their advantage.

We talked a year or two about this thing, and the result was that they paid no attention. Now, I say to you, gentlemen—I say to you, fruit growers—that if you ever expect to have anything done that will redound to your interest, you must say that you want it. No one or two men or a dozen men can accomplish it. They have so many ways of avoiding putting into force your wishes, excepting that you say you are determined to have it if you can get it under the laws of this country.

You see in that correspondence we have urged over and over again, and we have asked them and presented them in different ways, and at the last state convention the request was made that this matter go before the Interstate Commerce Commission. But it is a difficult thing. There is one way you can get it before the Interstate Commerce Commission, and it would be an effective way—here in the regular session. It was possible for the railroad commission to take this matter before the Interstate Commerce Commission in behalf of the growers, but there were some weak points in the law. That law has been remedied; it was remedied at the regular session and recently has been strengthened, so that if you say that you want your railroad commission—the law now rests with the California Railroad Commission—to take this matter up before the Interstate Commerce Commission, and if you get the State of California back of the Interstate Commerce Commission, you get the Governor back of it, and you get all the powers of the State back of it, you are going to accomplish something; but if you do not do it—we have been four years hammering on this, and we have been put off with this and that, and I feel confident you will never gain a point except through the national Interstate Commerce Commission—and if you do that, if in any way you present this matter through the railroad commission to the federal authorities, you will get relief; and it may not be necessary to appeal to them, because if your action is positive, you might get it without; but you will not get it without you say that you want it. Thank you, ladies and gentlemen. [Applause.]

MR. ASHLEY. I wish at this time to make a motion bearing on this freight rate report. Mr. Stephens opened up a part of the question. It would not be proper at this time to discuss the motion before it is made and seconded, and before the house, but I wish to say a few words. Yesterday at Lodi there was a mass meeting held of the growers, and they passed a resolution, and made arrangements for me to come before the meeting here. They telegraphed me last night, asking me to put this motion before the house. I will read a copy of the resolution that

was passed there, and then make the motion (reads): Moved that Messrs. Stephens, Angier and Hartley, the present State Freight and Transportation Committee, be and hereby are instructed by this convention to go before the State Railroad Commission and request them to take such action as will secure from the Interstate Commerce Commission, for the deciduous fruit growers of this State, a 20,000-pound minimum to all destinations, and a dollar rate to Chicago and common points.

MR. ASHLEY (continuing). I make this motion.

MR. STEPHENS. I second the motion.

THE CHAIRMAN. Are you ready for the motion? All in favor of the motion will say aye; opposed no. The motion prevails.

MR. STEPHENS. *Mr. Chairman and Gentlemen:* I assure you there will be nothing undone on the part of the committee to bring the relief, and we will proceed immediately to ascertain what can be accomplished along these lines. You can realize that if you take it up individually it will cost a whole lot of money, and inasmuch as you are paying the taxes to support the state government, there is no reason why the State would compel you; and while it may be necessary to have some special attorney on this, as they have down south, they have thought that they will have one. I do not want to occupy your time any longer, but I thank you for the vote that has been taken, and I assure you that there will be nothing left undone in the power of the committee to bring about the result that you wish.

THE CHAIRMAN. They say that bees are our great friends, because they work for nothing and board themselves. I think Mr. Stephens has done that for many years. Mr. Stephens has printed these reports at his own expense.

MR. STEPHENS. I wish to say that the committee has paid about \$1,500 since we were appointed. The remuneration we receive is not very great, but we have accepted the position, and I felt that we would be derelict in our duty if we did not do the best we could.

THE CHAIRMAN. I wish to appoint a committee—Mr. Galloway, Mr. Stephens and Mr. Ashley, a committee that was prepared for yesterday, in regard to the trip south—arrange for delegates to go to the meeting to be held in Los Angeles—and I hope that committee will meet and report as soon as possible.

THE CHAIRMAN. We will next pass to the Committee on Resolutions.

MR. BEERS. I hold in my hand a resolution that was offered to the convention by Mr. Craig. It is headed "White family help."

White Family Help.

WHEREAS, There is a constantly growing demand on the part of the farmers of California, for reliable "white help," especially on the part of horticulture farmers: and

WHEREAS, There are many thousands of white families, especially in the cities, towns and villages of our State, who would be mighty glad to get the work and ought to have it; and

WHEREAS, As a rule as conditions now exist so far as the college and public and private school vacations are made, thousands of orchardists can not have the help of their own children without keeping them from school during ripening period of their crops, and thus many hundreds of thousands of dollars are paid out in many instances to an unassimilable alien people, who are not citizens, who do not care to become citizens, and whom we do not want to become citizens—peoples who are in our

country for the American dollars they can earn, who by their cheap mode of living can thrive where white people would almost starve. Vast sums of money could be saved to the farmers if they could utilize the help of their own children of proper age. Under the child labor law (which we deem wise and good and heartily approve) not even parents have the right to keep their own children out of school; and

WHEREAS, It is conservatively estimated that no less than two million dollars is paid out annually for the gathering, curing, canning and packing horticultural crops, a large portion of which work women and children (children of proper age) can do, but as the school vacation period (with a few exceptions) comes at inopportune time, the white family help is not available and but a fraction of this vast sum of money goes to our own people. It ought all to go to them and it can be made to, provided the college and school boards of California will so adjust the college and school vacation period to coincide with the ripening period of the bulk of the horticulture crops; therefore, be it

Resolved by this Fortieth California State Fruit Growers' Convention, That we request and urge the college and school boards of California to adjust the school vacation period to coincide with the ripening period of the bulk of horticultural crops; and be it further

Resolved, That we urge the legislature at its coming adjourned session to pass a concurrent resolution urging the college and school boards to so adjust the school vacation period, and we most respectfully request Governor Hiram Johnson to include this request in his call for the meeting of the legislature, to the end that all college and school boards may make the much desired change before the ripening of horticultural crops next year; and that our secretary be requested to send a copy of this resolution to the governor, lieutenant governor, and each member of the legislature, to the mayors and all civic bodies of all the cities of the Pacific coast; to all the state, county, college and school boards; to all the city and county school superintendents; to the metropolitan press and all farm journals of the Pacific coast.

MR. ANDERSON. I move the adoption of the resolution without discussion.

MR. CAMPBELL. I second the motion.

THE CHAIRMAN. A motion is made and seconded. I think you are giving the secretary a pretty heavy dose.

MR. STEPHENS. Many of you remember how earnest Mr. Craig was in his remarks in advocating this, and if you will take into consideration the fact that in all probability it brought about his end, because of his earnestness—I was much impressed; I did not know the gentleman, but I was much impressed with the earnestness and seriousness with which he presented those remarks, and therefore, in respect to his earnestness and his memory, I would suggest that we have a rising vote on this resolution.

THE CHAIRMAN. Had we not better omit the last part of the resolution? The governor can not be asked to do this thing.

MR. CAMPBELL. I move the substitution for the last part, "such notifications as may be necessary."

THE CHAIRMAN. Will you accept that amendment?

MR. ANDERSON. Out of respect to that gentleman I move the adoption of that resolution as it was presented. Nobody could carry out an impossibility, and the general purport of the resolution could be carried out; that would be sufficient, and I believe it would be all right; and that was the reason I moved the adoption of the resolution. The Committee on Resolutions, of which I have the honor to be a member, thought that would be the proper thing to do.

THE CHAIRMAN. With that understanding, then, I will put the motion. All in favor of that motion will rise. The motion prevails.

MR. BEERS (reads resolution in regard to John Markley of Sonoma County):

WHEREAS, It is one of the privileges of attendance at the State Fruit Growers' Convention to make new friendships and renew old ones. On the other hand, as years roll by, each meeting finds some beloved and once familiar face missing from our ranks, leaving gaps that can never be filled. During the past year our fellow fruit grower and friend, John Markley, formerly of Sonoma County, one of the best loved men in California, has passed into the life beyond. We all knew him as a man of quick intelligence, of kind and generous heart, full of love for his fellow men, manifesting itself by a life of constant usefulness and friendly service to the communities in which he lived.

Resolved, That we lovingly testify to our appreciation of his noble life and express our sense of personal loss in his recent death.

MR. KELLOGG. I move the adoption of the resolution.

MR. ———. A rising vote without discussion.

THE CHAIRMAN. All those in favor of this resolution will rise. Unanimously passed.

THE CHAIRMAN. Shall we act upon these seriatem or as a whole? Just as you like. Shall we take a vote upon this? Are you ready for this resolution? What is your pleasure in regard to it?

MR. CAMPBELL. I move that consideration of the different resolutions offered—that every resolution be put without a separate motion; that it be on consideration of that resolution, without separate motion from the house.

HOUSE. I second it.

THE CHAIRMAN. Motion is made and supported that each of these be put without separate motion. Are you ready for the question. All in favor say aye. Contrary no. The motion prevails.

MR. BEERS.

WHEREAS, We appreciate the matter of control of the Mediterranean fruit fly by the Hawaiian Territory as a means of preventing the introduction of this destructive pest into our State; and

WHEREAS, It is brought to our attention that the Hawaiian Territory has not available means to completely finance the work being done at the present time; therefore, be it

Resolved, That the fruit growers of California here assembled do urge the governor of this State, his Excellency, Hiram W. Johnson, and the State Commissioner of Horticulture to further assist this work with men and finances as a temporary means of assisting them until they can provide by legislative enactment for the completion of this undertaking.

THE CHAIRMAN. Are you ready for the question? Do you wish to make any remarks—any one? All those in favor say aye. Opposed no. There is no opposition. Next.

MR. BEERS.

WHEREAS, In all our attempts to standardize and perfect our shipping products we are hampered by a small per cent of our producers and shippers, who will permit infected or immature and imperfect fruits to be shipped, usually to the injury of other consignors in the car, there seems to be no way by which moral suasion and mutual agreement can rectify; therefore,

Resolved, That we favor some legislation creating some fixed standard for our products and making any violation of this law a misdemeanor.

THE CHAIRMAN. Does any one wish to remark upon this?

HOUSE. Question.

MR. REED (of Yolo). I think that is a very important point, that we should have our shipments regulated like that.

THE CHAIRMAN. Does anybody else wish to speak upon this

question? All in favor of the motion say aye. Opposed no. There is no opposition to this motion.

MR. STEPHENS. I want to call attention to the fact that while we are locking the front door, if there is any way of locking the back door it would be a fine thing—the danger of the Mediterranean fly from other sources. Take South Africa, Australia, and other countries. There are importations of fruits from those countries in eastern cities, New York, for instance; several years ago there was a gentleman so fortunate and so generous as to pay the expressage on a package of plums that had been grown in South Africa that he had received. As a part of the consignment which he had received he sent a package out to me, but just about the time we were waking up in regard to the Mediterranean fly and instead of eating them—and some of my family took serious objection to it—I took the package over to the State Capitol and put them in the furnace. I do not know whether there was any infection; probably there was none. But if there is any way we could reach the National Government they should be reached. While we are preventing them from coming in from the Hawaiian Islands, they might come in in some other way. If we could direct the attention of the national authorities to the fact that they ought to be alive to the importance of this thing and prevent their entrance on the Atlantic coast, it would be the thing to do.

THE CHAIRMAN. We are doing that.

MR. BEERS.

Resolved, That the fruit growers of California give to the Panama-Pacific Exposition, to be held at San Francisco in 1915, their united and enthusiastic support, since in its far-reaching effects it must result in the rapidly increased development of our State and the material widening of our markets, it being a California enterprise and the greatest ever undertaken in the State, if not the world. Loyalty alone demands that every citizen give it his best encouragement to the end that it may be the biggest and best exposition ever held on earth, and in all respects worthy of our proud name.

THE CHAIRMAN. Any one wish to remark upon that? If not, all in favor say aye. Opposed no. It is unanimously passed.

MR. BEERS.

WHEREAS, The thrips problem is by no means settled, though much progress and success has been attained;

WHEREAS, The thrips experimental work in Contra Costa County has been discontinued;

WHEREAS, The growers of that county are enthusiastic, coöperative and united, and have done much elementary work as a foundation for future experimental work;

WHEREAS, There is much scientific work yet to be done; be it

Resolved, That the Department of Agriculture at Washington be requested to continue the work in that county by the men to whom the California fruit growers are greatly indebted for the success already attained in saving thousands of dollars to the growers of California from the ravages of the thrips.

Resolved, That copies of these resolutions be forwarded to the Department of Agriculture at Washington and to the State Development Board, Ferry Building, San Francisco.

MR. GALLOWAY. I beg to move an amendment, if I may, to that resolution, inasmuch as so much good work has been done in Contra Costa County, and the fruit growers there have benefited so much at the expense of the Government there, and inasmuch as the thrips have just entered Sonoma County and we need the work there, that the experimental station be transferred to Sonoma County.

MR. KELLOGG. I want to condemn this, and I think I have had

some experience in like propositions, that as an experimental station has been made in Contra Costa County, and they are equipped for it there, they are taking it up—I consider that in Placer County or Sonoma County we are just as much benefited through the experimental station in Contra Costa County as though it were in some other locality. I recall the peach moth being so disastrous to the State, and an experimental station was made in our county, and Warren T. Clark, one of the best men that could be sent there was sent, and every portion of the State benefited. I do not care whether it is in Contra Costa; every part of the State will benefit. You will all get just as much benefit as though it were in your own county.

THE CHAIRMAN. Unless this motion is seconded it is not before the house.

MR. KELLOGG. They are all under consideration.

THE CHAIRMAN. Mr. Galloway made a motion. That was not seconded.

MR. ASH. I believe my old schoolmate, Mr. Galloway, made that motion, but I want to say this, that that resolution should be referred to the agricultural department instead of the horticultural.

THE CHAIRMAN. That is understood.

MR. ANDERSON. Now, Mr. Chairman, I do not want to take too much of your time, but there are a great many things that we do not know. We do not understand about this work, and it is with fear and trembling each year that we enter this unequal contest with the thrips, and I think that there is not a grower in that county but what will agree with me that we do not understand many of the points. To illustrate just one moment: There is an 80-acre orchard near mine, where one year they did not harvest one single box of pears, of merchantable pears; there was only about six tons of falls or scabs taken from the whole 80 acres. On another orchard the grower did not harvest one box of pears. The following year in that 80 acres there was about 10,000 boxes of pears shipped East, and not one ounce of spray was put on that orchard. Now, it is a problem what became of those thrips that year. There were none in the county. I went repeatedly and investigated, and there were none on the trees to speak of. They harvested a magnificent crop. The experts did not know where they went. That is one of the problems. We growers in Contra Costa have not benefited at the expense of the department at Washington alone. We have spent our own money, and the county has appropriated money, and all of the benefits that we have received from our experiments have been given at large freely and willingly to the people of this State, and will be given. We ask that this resolution be passed. I have a great many letters from individual growers about them, and I have always answered and assisted those people; and I have not only done that, but I have offered to go to these different counties and assist them in making these emulsions for this work; and we will do that freely and willingly; but we ask that this work that is so well begun be continued where the foundation has been laid.

THE CHAIRMAN. Does any one wish to speak further upon this? If not, we are ready for the question. All in favor of the motion say aye. I do not need to put the contrary, but I will—opposed, no. Passed unanimously.

MR. BEERS.

WHEREAS, In the everlasting struggle against the introduction of injurious insects it is absolutely necessary for the protection of the first industry of California to have wide-awake, active, experienced, and competent officials at the head of the State Insectary, and at the head of the quarantine service at the port of San Francisco; and

WHEREAS, The long and tried services of the present incumbents have been proved to be absolutely satisfactory to the fruit growers of California; be it

Resolved, That the California Fruit Growers' Convention, in meeting assembled at Santa Rosa, December 20, 1912, do hereby endorse and appreciate the good services that the present incumbents have rendered to the California fruit industry under a former administration, and express the desire that they may continue their good work under the present administration.

THE CHAIRMAN. You have heard the motion. All in favor say aye; contrary no. The motion prevails unanimously.

MR. BEERS.

WHEREAS, There being many points of common interest to the growers and shippers of deciduous fruits and nuts in California that are not protected by any coöperative organizations, such as tariffs, transportation, legislation, standardization and other interests pertaining to the dried and fresh fruits and nut industry of California which could the better be managed through a central organization; therefore, be it

Resolved by this Fortieth California State Fruit Growers' Convention, in regular annual session assembled, That we hereby endorse the organization of the California Deciduous Fruit Protective League, now and being organized, and J. W. Jeffery as its manager, and recommend that the same be safeguarded by a competent board of directors, representing each shipping interest and each branch of the fruit industry on some proportionate plan, who shall have full power to act, and that we pledge to such organization our unanimous support and coöperation.

THE CHAIRMAN. Any one wish to remark upon this?

MR. STEPHENS. In regard to the board of directors: I wish you would read that over again, please.

MR. STEPHENS. I do not want to be technical, but it seems to me that there ought to be other representatives of fruit growers' associations and other organizations, and so forth, outside of the shipping interests. I think that is a good thing, but I do not think that the board of directors should be wholly shipping interests. I think that should be amended so that the fruit growers themselves should have representatives upon that board of directors. With that exception, I am strongly in favor of that. I think the league should be organized, and I think it should be composed of shippers and growers. It should be organized on the acreage plan for growers. If the growers are going to support this league, they should be entitled to representatives on the board of directors, and if that part is qualified so as to admit them, I am in favor of the resolution.

MR. KELLOGG. I want to say that there is no intention to omit the growers, and I am perfectly willing to accept this insertion. And I am perfectly willing to have it amended. My intention is that this body and every one interested shall have proportionate representation on the board.

MR. STEPHENS. I am not impugning Mr. Kellogg's motive. I understand Mr. Kellogg is perfectly sincere, but Mr. Kellogg will see it will be a little better qualified, and if you will please qualify it, it will be perfectly satisfactory and I think will be to everybody in this hall.

THE CHAIRMAN. With that understanding they can put that in; I think they can be left to put that in. All in favor of the motion will

please say aye. Opposed no. The motion prevails, and that change will be made by the committee.

MR. BEERS. Your committee on resolutions are not quite ready to report on some other resolutions that we have before us. We thank you for this privilege of partially reporting this morning.

THE CHAIRMAN. I would like to ask if Mr. Hotle is present.

MR. NEWCOMB. Mr. Hotle expects to read that paper this afternoon. He read his program wrong.

THE CHAIRMAN. We hope there will be time, because we have been disappointed in one paper this morning. Then, this, ladies and gentlemen, exhausts our program.

I wish to call attention to one matter that seems important. This afternoon we are expecting to have an article on the "Soil Bacteria and Humus," by Dr. Shaw. I have a telegram from Dr. Shaw saying that he can not possibly be here, so that paper will not be forthcoming. Then we will have a paper by Mr. Reed of Sacramento on "Pear Culture" and another one on "Pear Blight," illustrated, by Mr. Gammon of Courtland. If that is all, there will be plenty of time for Mr. Hotle to take up his subject.

To-morrow the committee on arrangements here have suggested that we take a trip through the valley to see the good things of Sonoma County. The electric cars will leave the courthouse at ten a. m., and they will return at 12:30 noon. Everybody is invited to take a trolley ride, to go to Sebastopol. That being the case, it will be almost impossible to have a session to-morrow morning, and I do not see why we need to.

THE CHAIRMAN. I know that Mr. Powell wanted to be here very much, but he is in Washington; he said, "If I can possibly come I will," but the last letter I got from him said that he could not possibly get away until Tuesday of this week, so it would be utterly impossible. I regret this very much, because if any of you ever heard Mr. Powell you would know it would be very interesting and a great treat. That being the case, and inasmuch as we have had the reports of the committees, I do not see that we need to meet to-morrow at all. So if you think wise, we can finish up to-day and just have the ride to-morrow forenoon. It seems to me we shall be able to complete our program.

MR. BEERS. I move you that it is the sense of this assemblage that we complete our program to-day and be ready for the final act to-morrow with our friends of Santa Rosa.

(The motion was formally presented and carried.)

THE CHAIRMAN. Now, ladies and gentlemen, we have a clear field, and we can discuss anything that is desired. Has anybody anything they would like to present?

MR. BANKS. Now, I have some of my people from Mendocino County here and they are new people to the State, and we want to make some inquiry in regard to using explosives in orchards. We would like to know if any one has had any experience, also in using it between the trees, and also for using it for the purpose of planting. If any one has any experience on that line we would like to hear it.

THE CHAIRMAN. Has any one had any experience in fixing the orchard for planting and breaking up the ground?

MR. GARDEN. *Mr. President and Ladies and Gentlemen:* I have had very much experience in the use of explosives, and I have also had

the opportunity of being present at demonstrations given by the Du Pont Powder Company. The results obtained were very satisfactory, but it is necessary in order to obtain the results desired that one sees a demonstration before he launches out to blast out large areas of land suitable for planting, so that he may do it economically and obtain the best results from powder. With 40 per cent nitroglycerine dynamite, the force is very concentrated and a very large percentage of the force is downward; 35 per cent has a less percentage of downward tendency, and yet has too much downward tendency to produce the proper results for the planting of orchard work of trees. Twenty-five per cent dynamite is of the slower expansion, with more upward tendency to break up the soil. One of the main points is to study the nature of the soil with which you are dealing. Some soils are composed of a hard sandy formation, and underneath that hard formation the soil is very close. Now, in order to reach the best results from the least amount of powder used, you have to pay attention to the placing of the charge. According to the nature of the soil you have to regulate the depth of the hole, and according to the amount of force extended upward you obtain that by loading, that is, by tamping. In the San Joaquin Valley, where it was demonstrated by an agent of the Du Pont Powder Company, the soil chosen for the demonstration was of a very heavy, tenacious, solid substance, and five feet from the surface there were about eight inches of hardpan. Underneath the hardpan was a yellow clay loam. The average depth of the hardpan from the surface before the general boring took place for the placing of the charges was ascertained and one spot was selected where there was a basin without natural drainage, and the water had stood there for years, running in from all around, and without any outlet except evaporation; consequently, that was a piece of soil that was of very little use. To illustrate and to show the people the advantage of the powder in drainage he bored a hole about eight feet deep, and put in five sticks of giant powder, 25 per cent, and loaded it heavy, and when the charge was fired it blew a hole right down through the hardpan into the water-table, and by tamping it on the top it also burst a very large area about fifteen to twenty-five feet wide in the shape of a funnel. This was explained by the demonstrating agent, and it is now supposed that no more water will stand in that hole and no more alkali is supposed to rise to the surface, for the reason that when the water collects in that basin it will go down into the natural water-table, which is about twelve feet on an average from the surface, and will take the alkali with it and carry it away instead of raising it to the surface.

As to expense, the probable estimate per acre was given, and the price of the powder, I believe, is about \$11.45 per hundred at the Du Pont Powder Works, and half a stick of dynamite, when properly understood in regard to placing it, will produce even better results than a whole stick. That is one of the points that those intending to blast for orchard purposes ought to get clearly into their heads. That is my observation and my experience, and it is one of the grandest things, I believe, that has ever been discovered; because all this alkali land is good land if one only knows how to handle it, and it has the drainage. That has been the great drawback—absence of drainage. It is just like a barrel, an alkali basin; it is like planting anything in a tub and filling it up with water, because the floor plan of the San Joaquin Valley is

like an ocean, the depths fill up with water and it causes a great deal of damage to the trees.

MR. WEEKS. I arranged with the Du Pont Powder Company to give a demonstration at my place at Red Bluff. It is very instructive, and I believe it will be of great benefit to a great variety of purposes to use this. You understand they will give a demonstration to-morrow, and any one that can attend that will receive great benefit.

THE CHAIRMAN. About a mile out on our trip to-morrow they will have a number of charges, and you can all see how the work goes on.

MR. CONE. I would like to ask Mr. Garden, besides the gravity lift, what was the diameter of the hole that was made by the charge?

MR. GARDEN. We could not ascertain the diameter of the hole. After the blast was fired, down to the hardpan, it was about five feet. The hole through the hardpan was only about six inches in diameter, and underneath that hardpan we took a long fishing pole and put it down, but we could not ascertain the diameter of the hole that was blown under the hard formation, but it went right down into the water level.

MR. CONE. Was the charge placed right on the hardpan?

MR. GARDEN. It was about two thirds through the hardpan. It was a little too deep a place, which showed by the small hole made.

MR. CONE. Did you ascertain satisfactorily that the concussion on both sides amounted to 25 feet? You stated that the effect of the dynamite was 25 feet wide—that is, from that shot. Did you ascertain that the concussion reached 25 feet?

MR. GARDEN. Yes. The ground was cracked up in a funnel shape to that width. We did not dig down to see how far it was blown up next to the hardpan, but the surface was all jarred up that width; and they calculate in orchard work for one shot every 40 feet, taking two sticks of dynamite; and then if you want to burst it all up, if it is a hard formation, you put in a small charge in between.

MR. CONE. Would it be safe to plant immediately, the same season, if you blast the ground late in the season? Would it be safe to plant trees before it is settled? I had a little experience in blasting with black powder in planting elms in a schoolhouse lot, and I lost one third of the trees; they died; and we never could attribute it to anything but that the ground settled back and dried out; so that unless the ground could be settled artificially or by rain, I think there would be a danger of the trees drying out by the soil being so loose.

MR. RUTHERFORD. In Butte County, on the Hearst estate, some twenty years ago, we shot a great majority of the holes where we planted orange trees—twenty years ago, and the trees for two or three years seemed to grow unusually well in those holes that had been shot. Mr. Mills could probably tell us how they are doing now. I have not visited the place for a number of years.

MR. BANKS. I would like to ask, at the time those shots were fired, the condition of the soil. Mr. Cone says his trees died out. Would it not be a proper time to do that blasting when the soil was moist? In other words, make a reservoir there for the plant?

MR. RUTHERFORD. In Butte County there is always plenty of water in the winter time.

MR. GARDEN. I think that blasting with giant powder depends a great deal on the character of the hardpan underneath and the slope or fall of the land per mile, and such things as that, because I have been using giant powder for fifteen or twenty years, for one thing and another and about ten years ago on a piece of land that was a bad water hole. The hardpan was less than three to four feet from the surface there on an average. I blasted that place, put down three or four sticks in two or three locations, and there the hardpan must have raised below it or something, because that water is still there.

As to the downward force of giant powder: My experience is that giant powder goes so quick it goes wherever it can have a chance. To try that out, I took a slab of oak with the bark on it, about three inches thick, and probably a foot wide, and I put a support under each end and then laid half a stick of giant powder in the center. It did take the bark off of that, but it did not break that three-inch piece, so the force is not all down by a whole lot.

MR. WATMAN. I presume that I have used a great many carloads of powder in my lifetime, and I desire to state this to all those who think that the force of powder is downward, that they are very badly mistaken. The actual force of powder is identically in all the directions the same. There is no question about that at all. But relative to the action that this gentleman says that they got, from the powder, that is due to the fact that the hardpan is harder. The harder the substance the better the execution. If you want to do work with powder, get it into the very hardest places you have. It is very interesting to me, because I am satisfied if properly understood and used it will be of great advantage for a great deal of soil in this country that is affected by hardpan.

MR. HICKMAN. I happen to be right close by a rock quarry, and the downward pressure is what they want. They blast down large cliffs, and all the large boulders of rock are broken up by placing a stick of dynamite on the rock itself and a bucket of wet clay placed over it. Probably in a day you will hear five hundred blasts of that character. They shatter the rocks perfectly with downward pressure.

(An adjournment was here taken.)

AFTERNOON SESSION.

(After an entertainment by songs and music the gathering was called to order, and the proceedings continued as follows):

THE CHAIRMAN. Although we are a Republic we are glad to have Kings. I am sure we take pleasure in hearing from the Pear King of Northern California, Mr. Hayward Reed of Sacramento.

MR. REED. The title is a very undemocratic one, and it is very much exaggerated.

BARTLETT PEAR CULTURE.

The Bartlett pear is one of the most stable and profitable of the deciduous fruits. I have been asked to write a paper on pear culture, and I will confine myself to my own experience in that line.

The pear proposition is interesting, for each year some new problem is encountered that requires study and work to overcome. During the dark years around 1894 to 1897, I remember my father's orchard deteriorated. The San Jose scale, the codling moth and the terrible attacks of the fungus disease, known as scab, produced for the most part second-class fruit, and this, combined with the low prices, nearly put us out of business. At this time, my brother, Charles Wesley Reed, took control of the orchard, and following his vigorous work of pruning, spraying, fertilizing and cultivating, the old orchard came to the front again and produced the high-class product of former years.

After three years' experience in the Philippines and Alaskan provinces, I returned home and engaged in the fruit business. I rented one place at first and then increased my business as my bankers increased their confidence in me. I remembered the work of my brother, and this method had the effect the first year of producing large crops of first-class fruits. I will give a description of my work for one year on Rose Orchard, near Sacramento, formerly known as the Lovdal Orchard.

After the crop is harvested, I plow the ground, putting it in good shape. On the 1st of November I started the fertilizer drills moving and used 20 pounds of fruit and vine fertilizer to the tree. This is put in early so the rains will carry this plant food down to the roots when the tree begins to grow in the spring. Two years previous to this, I had applied 2000 pounds of barnyard manure to each tree, thus putting humus into the ground.

On November 1st I also begin pruning the trees. I regard this as very important. Two men skilled in blight work search the trees ahead of the pruners, looking for this fell disease, which, at the present time, has destroyed thousands of trees and has a severe, and in many cases fatal, hold on tens of thousands of other trees.

I prune so as to have plenty of light and air in the middle of the trees. I leave stubby, interior projections from the main limbs so that fruit will come but not shade. I cause the trees to grow a little higher each year. Also permit the limbs to grow as long as I can on the outside, thinning them out, but leaving the fruit buds wherever practical. I am training the limbs to drop to the ground, for I believe wherever there is an unoccupied space it can be profitably filled, for light and air and

room are great factors in causing fruit to grow. This is true especially when the tree has plenty of food to eat and plenty of water to drink.

I believe it is a good practice to chop up the prunings into small pieces and plow them into the ground, for in two or three years they decay and the ground is made richer. It is surprising the amount of prunings taken off a large tree in five years. If the wood is diseased, however, it is better to burn it.

In February the spraying apparatus is overhauled. I have a pipe system that enables me to spray the orchard rapidly, and that is very essential in these days when quick work is needed. Hose from 175 to 200 feet long is attached to each of the nipples at regular intervals, and one man can spray—the way my trees are planted—196 trees without changing his hose. If he can spray this in one day with sulphur-lime solution he is doing well. My pipe line will handle twenty streams at one time. With the Bordeaux mixture I can spray the whole place in one day, if necessary. Those present may know that in fighting thrips it is a very potent proposition to get spray on at the right time. The thrips arrived at Sacramento this last spring; we will see what they do this coming year.

About the 1st of March I apply lime-sulphur solution. This cleans the trees and helps in the fight against scab that follows in a few days.

When the buds are half open I apply the Bordeaux mixture three times. I understand a thrips mixture should be applied just before this spray and after the lime-sulphur. It is obvious that this is a spraying time, when seven or eight applications have to be made in two weeks.

Usually the last week in April blossoms are out and cultivation begins, for the weeds are growing fast. Ten days later I administer the first arsenical spray, arsenate of lead. I can apply this through the pipe, if the sprayer never shuts off the nozzle; otherwise, it settles in the pipes, and great loss comes from leaving fruit open to the attacks of the codling moth.

Two weeks later I spray again with paris green. I use power outfits and hand pumps at this time. On June 1st I spray again; also the last time on July 1st. The orchard should be plowed in June, and this keeps the weeds down during harvest time.

I pick the pears three times with rings, the bulk of the crop generally going to the canners.

On the New England Orchard, at Marysville, there are difficulties I do not have on the Sacramento orchard, and so each locality has its separate problems to solve. One disease may be serious in one place and in another may not. On small trees and large trees alike there are no less than nineteen troubles that I know of which affect pear trees more or less seriously—one instance I will describe.

At Marysville, during June, it was noticed that something was eating the leaves off the young pear orchard. Some of the trees were bare of leaves. The Japanese boss finally dug around the trees and found hundreds of beetles. I took some of these to Mr. Jeffrey and he described them as June bugs, and said they would go away shortly, but they did not. He said there was no remedy, and I told him that I would cover the trees with mosquito netting if necessary to keep them off. He suggested cheese-cloth, and, buying all of this commodity that Weinstock-Lubin Co. had, I covered the trees. They now went to the larger

trees, but did no serious injury there. It was fully two months before they disappeared. The young orchard presented a curious appearance on a moonlight night, facetiously spoken of by one as "having their nightgowns on."

Our fruit industry would be in a deplorable state if a wise government did not take the trouble to study and find remedies for agricultural and horticultural troubles. [Applause.]

MR. REED (continuing): I have been asked to speak a word or two about my system of spraying. In a few minutes I will describe this (referring to diagram). This represents a section of an orchard, about an acre, I might say. The architect of this building was Mr. E. A. Boyle of Sacramento, and the draftsman was Charles A. Bourn, so I am not entirely responsible for this drawing. In this house is a five horse power motor or gasoline engine; and for a pump I used the Giant Bean Spraying Pump and put a pulley on the pump, and from a shaft overhead I get my power and I do the entire mixing in this building under cover. I have a three-quarter inch galvanized pipe and run it through the middle between the rows as far as necessary, and where I want to run a side pipe off I have a union and service cock on each one of these branches, so that when I want to turn the spray down this line I open it up and then turn it off and run it down another pipe. All of these pipes can be run at one time. At a distance of three trees on this map I run the hose out, and this hose can spray the entire block on this side and the same way on this side. If necessary a "Y" can be put on this nipple and two streams can run at one time, or, in the middle of the hose, if necessary, a "Y" can be placed, so that a person can spray at the same time, especially with a lime-sulphur solution, where it takes a longer time to spray, it is practical; but where you are spraying with Bordeaux solution, where a light solution is necessary, one hose is all that is necessary, because one man carries the hose and one man uses the rod and they change when the one that carries the hose gets tired. As I say, on an orchard of 6,000 trees at Sacramento I can have twenty nozzles operating at one time; and I have sprayed the orchard in one day of nine hours. I went over the entire system from the house clear to the other end and sprayed it with Bordeaux mixture. Of course, with lime and sulphur it takes a longer time. I do not know whether tobacco emulsion will go through it, but I understand it will. The water runs through the pipe very rapidly, especially when you have a good many hose attached. These pipes can go as far as 3,000 feet into the field and still have a good pressure at the other ends, and also the side lines can go through the orchard. [Applause.]

MR. PEASE (of San Bernardino). Why do you use the Bordeaux mixture, and have you ever used the arsenate of lead?

MR. REED. I might say that one reason is, it is a good deal cheaper and I did not want to take any chances. I used arsenate of lead one year, and I do not know whether it is successful. You can use arsenate of lead if you want to; but it is very expensive to use it through a pipe system unless you are very careful, because you have to keep the nozzles open to keep deposits from forming. I think arsenate of lead is better than paris green.

MR. PEASE. I want to ask one other question: What was the color of the beetles?

MR. REED. Brownish in appearance—dark brown. The head was smaller and the bodies were larger. Were the beetles you noticed longer than they were broad?

MR. PEASE. In the southern part of our State we have several varieties of beetles. They eat the leaves in the daytime.

MR. REED. These do not work in the daytime; they work at night.

MR. NEWCOMB. I would like to ask how much pressure you can maintain with a five horse power engine and twenty nozzles running?

MR. REED. Two hundred pounds pressure.

MR. WEEKS. What is the comparative cost between a system like that and an equally efficient system with power sprayers? This would be rather cheaper, wouldn't it?

MR. REED. I might say that four years ago I tried it with a piece of hose 1,200 feet long and then I tried a long piece of pipe about 2,000 feet long, and when I found it worked all right I installed a pipe system. The pipe cost about five cents a foot; it lasts longer than hose. If you have fourteen nozzles going it is the same as second-hand outfits. Here the supply is continuous and you have none of that extra repair and extra hose—very much cheaper.

THE CHAIRMAN. What was the cost of installing this?

MR. REED. Something like six or seven hundred dollars for about 6,000 trees. The price of a power outfit would almost pay for it. But as a labor saver it cannot be compared with anything else. I did it because we had thrips up there two years in succession, and, of course, we couldn't get over the ground with a wagon, and we sprayed with a pipe system where we could not get over it with a wagon or hand system.

MR. BOWMAN. Are you troubled with scab any?

MR. REED. That is the reason that I was so anxious to get it installed, because scab is our worst enemy, but it is good for any system. You can run arsenate of lead and Bordeaux mixture and lime and sulphur through it.

THE CHAIRMAN. Any other question? You do not often get a chance at the King.

MR. BISHOP. I would like to ask this gentleman if he noticed the presence of these beetles, and if the soil had anything to do with them?

MR. REED. This was a very sandy soil.

MR. BOWMAN. What was the size of the beetles?

MR. REED. About three times the size of a house fly.

MR. BOWMAN. The regular June beetle type?

MR. REED. So Mr. Jeffrey said.

MR. BOWMAN. We have a great many of those beetles in our county.

MR. REED. They would eat the arsenate of lead.

MR. TURNER. I would like to ask Mr. Reed if he thought his system would work equally well on a hilly ground, or on a hilly orchard? Would he be able to keep that pressure with a five horse power engine if he had to force it up the hill?

MR. REED. I would put it on top of the hill.

MR. TURNER. It might not always be convenient to put the plant on top of the hill. It would seem natural that it might affect the pressure.

MR. REED. One hundred feet up the hill would naturally affect the pressure.

MR. TURNER. Probably you would have to double your engine power?

MR. REED. Yes.

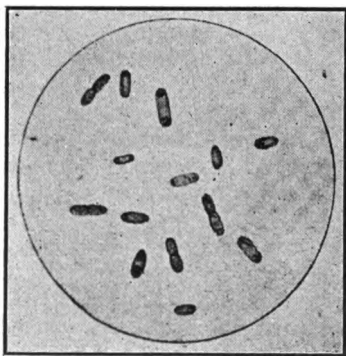
THE CHAIRMAN. This opportunity is just about gone. Mr. Reed, we are very much obliged to you. [Applause.]

The next topic is a kindred one, "Pear Blight and Its Control." by Mr. E. A. Gammon of Courtland.

PEAR BLIGHT CONTROL.

MR. GAMMON. *Mr. Chairman, Ladies and Gentlemen:* Waite defines pear blight as a contagious bacterial disease affecting the pear and allied fruit trees, such as apple, quince, crabapple, also ash and hawthorn.

It attacks and rapidly kills the blossoms, young fruits and tender twigs, runs down the living bark to lower limbs and trunk of tree, or it attacks sprouts and suckers around the tree, and runs down the bark of these to the root proper, trunk, or crown. Its first appearance in the spring is in the form of black or blighted flowers, young fruits and twigs.



Pear blight bacteria. Highly magnified. (U. S. Dept. Agrcl.)

In the fall the foliage turning to dark red before the majority of leaves have changed, is a very suspicious sign of the disease. Careful inspection of the limb, trunk, and crown just below or under the suspicious limb is the correct method of determining whether or not blight is present. This will be shown later on in the cuts to which I will call your attention.

One of the most serious aspects is that the microbes live and multiply in the nectar of the blossoms, and bees, bugs, flies, and birds readily carry these microbes from blossom to blossom, from tree to tree and from orchard to orchard. For this reason it is very difficult to control this disease.

One neighbor may be neglectful, thus furnishing a starting or seeding place with enough contagion present to ruin all orchards for many miles.

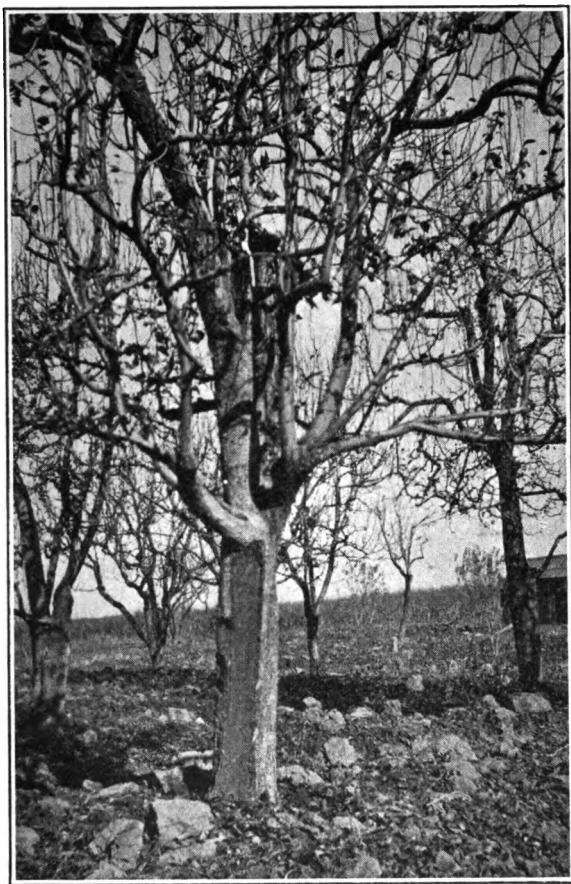
The only remedy recommended by the best authorities is the use of the knife and saw thoroughly disinfecting after each cut.

Soon after the first appearance of the dread disease in our county, Mr. M. B. Waite of the Department of Agriculture called at our farm. We fully discussed the disease, manner of control, and the probable expense.

I asked, "Will this pay?" He replied, "How many pears do you raise each year and what is the usual price?" Then he said my method or system of pruning must be changed, all spurs on lower limbs and all

suckers must be kept off and all diseased parts of the tree must be removed, and where impossible to clean up a tree by cutting out diseased wood, to remove the tree.

After comparing cost of the plan outlined and the net returns from orchard, we decided it *would pay well*. I at once went at it and have now put in seven years' active campaign. The second year we lost 475 trees, the third 165 trees, the fourth 38 trees, the fifth 14 trees, the sixth 1 tree, and the seventh 2 trees, but have worked on and saved hundreds.



Pear tree treated for pear blight. All infected bark and wood removed. (Original.)

This year we have shipped from these forty acres of trees twenty-seven thousand five hundred boxes of pears. In this time we have expended six thousand one hundred and seventy-eight dollars, or a little more than \$154 per acre, besides incidentals, such as disinfectants, tools, sponges, etc. Some large trees have taken one half a day of hard work on the part of an expert to clean up a single tree.

The cuts will show more clearly what we mean in speaking of cleaning up.

We keep an expert by the year who goes from tree to tree in the orchard, beginning in the spring at blossoming time and continuing during the whole season, with perhaps the exception of one or two months. His work is the cutting out of every blighted twig, disinfecting the tools after each cut, and when cutting a limb always to examine it to see whether or not he has cut into a blighted portion. If he has

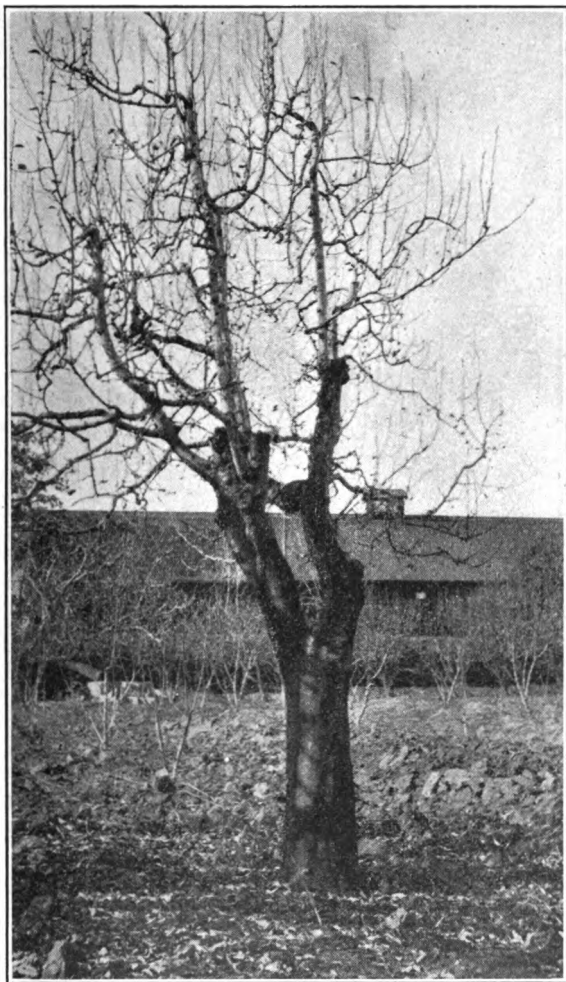


Pear tree treated for pear blight. Entire side of trunk removed. (Original.)

done so, he must immediately disinfect his tools and cut again lower down. Sometimes it is necessary to remove limbs as large as your arm, sometimes cut off two or three large limbs, and clean off bark and diseased wood from trunk of tree down to ground, dig around and under tree and cut off one, two, or three large roots. It is imperative that every trace of diseased wood or bark be removed and the cut thoroughly

saturated with a solution of corrosive sublimate. Later on it is best to paint the scar with good paint to protect from weather.

This campaign is continued until fall, when every tree in the orchard has the earth carefully taken away from crown and is gouged with a quarter round chisel. Some large trees we have gouged in as many as fifty places, for it is impossible to tell whether or not a rough bark tree



Pear tree treated for pear blight. Showing removal of bark, as well as many of the larger limbs. (Original.

is free from blight by its appearance on the surface. In our orchard sometimes the blight may be found a quarter of an inch from a previous gouge mark, which was O. K. By this system of gouging it is almost always possible to detect any trace of the disease in crown or trunk. In very large trees we also gouge the large limbs, especially at forks.

In one portion of our orchard were about fifty trees, fifty years old,

and near by a young orchard with trees from four to eight years of age. In this young orchard blight kept appearing and we lost nearly half of the block. At last we discovered a gummy exudate in crotches of the old trees. After much work and repeated inspections we were able to get rid of all blight in old trees, since which time no trouble has appeared in young orchard.



Pear tree treated for pear blight. Showing how the infection started from a single limb, which was removed. The gouge marks are plainly visible on the healthy limbs. (Original.)

Warm, damp weather during blossoming time is very favorable to the spread of the disease, and on the contrary dry, cold weather is favorable to blight control. This fact has led many successful orchardists to underestimate the seriousness of this scourge. For the past three seasons the weather conditions have been very favorable to blight control, and in our neighborhood not a few, thinking the disease had run its course,

have gone to sleep on the picket line. I predict that one warm, moist spring will so aid in the spread of this disease that I would not be surprised to see over half of the pear industry of the State wiped out.

In the way of advice, I would say to one contemplating planting a pear orchard, that unless you are willing to put up a fight from the first season on forever, you had better stay out of the pear-growing business.

I would also urge the foolishness of expecting the Japanese or Chinese laborers to act as the experts for exterminating pear blight, as our own experience has proven it inefficient. They will not disinfect after every cut nor will they cut below infected wood. As there are many Japanese in our section, I thought it advisable to have all rules for blight control translated into the Japanese language and had over a thousand copies printed. During one season, which was especially favorable to blight and the disease seemed unusually malignant, I let the Japanese, who were anxious to do the work themselves, help with the cutting under the supervision of two experts, a copy of the printed rules in the hands of each man.

I later found that in nine out of ten limbs on which these men had operated the disease had gone on, showing conclusively that they not only did not disinfect properly, but had failed to cut below the infected wood.

Non-suckering stock is the best relief I believe we can hope to find, as any one at all familiar with the work can cut out plainly diseased limbs, but only an expert is fitted to cope with the root, crown or trunk trouble coming at these points through the suckers. Partially immune stock, such as Le Conte or Kieffer, I also recommend. These to be reworked into the desired variety. During a malignant blight season, checking the growth by little pruning, cultivation, irrigation, or fertilization, will aid much in holding back the disease, as generally the more thrifty the tree the more susceptible to the disease. I believe when water is available for irrigation it is best to seed the orchard to alfalfa and thus in a way lessen the danger from plow contagion, as well as through mutilated root suckers.

MR. GAMMON (continuing): If there are any questions that any one would like to ask I would be glad to answer them.

THE CHAIRMAN. What do you mean by an expert?

MR. GAMMON. I sent to one of the agricultural colleges and had a graduate come and work on the trees. Then I had men trained under him. I have one man now that I have had four years. That is what I hired him for. That is his business, his work, and everything else must stop for the pear blight fight. Some say that is a whole lot of money to spend, \$154 an acre, but sometimes I have twenty or thirty thousand dollars' worth of pears. That is what I mean by an expert, a man trained in the business. Only an expert will cut the blight out. I have had a man dig out a hole away down to his shoulders in trying to get at the roots. I think it pays, and as I said, we have had three years very favorable to blight control—dry, cool weather. They say in regard to those experts, that if we kept them any longer, we would have no trees left, but I have not a doubt that we will have the same results other people have if we do not fight the pear blight.

MR. GALLOWAY. I would like to ask if the blight follows the roots for any considerable distance, if you have to take out the entire root.

MR. GAMMON. As soon as we find a large root affected in any appreciable degree around it, we chop the root right out.

MR. GALLOWAY. Even if a part left does not show traces of blight, do you cut out the root?

MR. GAMMON. If I can not cut out every spot of blight, out comes the tree; I never try to hold the tree. I would rather lose five boxes of pears than take chances. I am afraid of blight. I tell you, losing as many trees as I have done, and seeing what it has done, I do not want to take any chances, and I would rather lose a dozen trees. I have found out that the owner, the proprietor, is no man to do the work, as he gets very tender when he goes out into his orchard. He says, "Never mind; I believe maybe that will grow." You had better keep away. Tell your man to cut them out, and then keep away from them.

MR. BLOOMER. I want to congratulate Mr. Gammon and Mr. Reed on the thorough work they have done. I tell you, this work pays a hundred times the expense. I know what this means. I believe thoroughly in a thorough clean-up of blight in both parts of the State, on both sides of the Sacramento River, at my place in Yolo County, and I believe, as Mr. Gammon has said, unless this is done there is a constant chance of losing thousands of trees in a single year, as it was when Professor Waite came up. There are different methods used by different people; but I believe that we have reached the time when such men as Mr. Gammon and Mr. Reed will be able to organize a protective association so that we can fight the blight and thrips and do it with the backing of an organization. We can go before the supervisors of the county to stand back of us and be willing to spend the money, and not keep us waiting five or six months until money comes into the general fund. A year ago I started a systematic campaign on the blight, but there were some complaints made to the chairman of the board of supervisors that I spent money unnecessarily on pear blight, and the result was that I had orders to stop the inspectors on that systematic clean-up. I am only waiting for the time when things will be just right, and when I have the backing of the growers to go to work again and make a systematic clean-up, and I am sure that Mr. Hecke and Mr. McBride of Solano County will have the backing so that we can work in conjunction and anihilate this pear blight.

MR. GAMMON. I will say, if you wait until you have things perfect, you will have the blight with you. You have got to work on that game at once. If you depend on the Supervisors, by the time you get them ready you have lost your orchard; so my proposition is "Play ball yourself."

THE CHAIRMAN. Any further discussion of this subject? I would like to say just one word about this. It is more important than many of you have dreamed of. If you have not read the last reports of the Florida Horticultural Society, it would pay all of you to get it and read it. There Professor Fawcett has demonstrated that gummosis of the peach is very closely related to this, and also the gum disease of the citrus fruit. He finds that it is the same. And he finds that this same method of drastic cutting thoroughly done is a certain cure. That is very interesting. We did not suppose that gummosis was a bacterial disease, but he has proved it is at least in Florida. You can see there is good sense in this. The bacteria will keep spreading and spreading.

There is just one other thing I wish to speak of: Mr. Gammon said that the younger trees seemed to catch the disease from the older trees. And he said he noticed there was some gum in the crotches of some of the older trees. Let us see how this occurred. The trees when they are wounded exude a gum which, like the nectar of the flowers, harbors the germs. The bees seek this gum for propolis, and they get it on them, and then they go to another tree, and thus the contagion is spread.

Is there anything further?

MR. ———. Where did you get the Florida report?

THE CHAIRMAN. If you address the State Capitol at Tallahassee to the Secretary of Florida Horticultural Society at Jacksonville, you can get it.

I will now call on Professor Chase of Fair Oaks, who is to talk on "Noxious Weeds."

NOXIOUS WEEDS.

MR. CHASE. Conservation of our natural resources has become a phrase of measureless significance. It seems to have been coined at the right time and by the right man to give expression to a universal and indefinite feeling that something must be done. This phrase exactly meets the condition which satisfies this universal desire to have something done. It loses none of its force when it is applied to the conservation of plant food.

Standardization is only an indirect mode of conservation. Standardization means better fruit, hence better prices, more prosperous homes, and a higher type of citizenship. This means conservation of plant food. When all things are working at their best in order to contribute to the same ultimate end, there is a mighty and subtle force gently stealing into the personal agent, and unconsciously lifting him into a higher state of action. When waste is seen on all sides, waste of soil by floods and erosion, waste of soil fertility by prolonged saturation, waste by needless plant growth, robbing the soil of a food which has been prepared for another plant, there is a conscious demoralizing force which is gradually lowering our standards and letting us down from higher planes of living into the lower levels of life. We can not, if we would, escape the influences of environment in the daily walks of life on our habits of thought and in the formation of character.

When soils lose their fertility the prosperity of the State decreases, land values depreciate, and commerce declines. When we permit the destruction of the fertility of our soil, we become robbers of the necessities of life and defaulters of an inheritance left in our hands, and leave behind us a train of desolation and distress. At least that is the tendency.

It is impossible to overstate the value of conserving our soil fertility in the field of horticulture; for on this conservation of our soil depends the future growth of the State and the welfare of the citizens. This means much for us as a state, for view the matter in any light we please, our commonwealth is destined to have much to do in the solution of problems relating to our social life, civic purity, and national welfare. In a very large degree these problems must be solved on the Pacific coast, and the right solution of these must depend upon the kind of citizenship our greatest and most important industry shall create.

Weeds in General.

Weeds are noxious in two ways. One way is the amount of plant food they consume. When it is taken into consideration that plant growth requires from 225 pounds to more than 1,000 pounds of soil water to produce one pound of dry matter, we get some idea of the injurious effect of weeds in retarding the growth of cultivated plants. In our semi-arid climate, every ounce of water is needed to produce crops of our highest standardization. It has been calculated it requires 7,000 pounds of water to produce one box of navel oranges, and weeds take no less water than the cultivated plant-producing fruits. Thus, we get some idea of the robbery that is taking place in our fruit fields.

The second way in which weeds are noxious is, in addition to taking plant food, they produce an injury to the plant by leaving in the soil a poisonous influence. According to Dr. Whitney, Chief of the Bureau of Soils at Washington, weeds leave behind them that which destroys soil fertility. "Weeds must be kept out, not because they use water nor because they use plant food, but because they are prejudicial to most crops! They have a poisonous effect on the crop. It is a case of incompatibility of association; they will not grow together. They poison each other": Whitney. Experiments conducted at Cornell University seem to fully justify the conclusions stated in the above quotation.

Noxious Weeds.

Those weeds which not only consume plant food and water, but actually dwarf or destroy plant growth, are called by the law of our State noxious weeds, a list of which is given in our statutes, including such as the morning-glory, Johnson grass, Russian thistle, etc. It will be impossible in this paper to give any description of these weeds or the modes of eradication. Our agricultural and horticultural institutions can supply any number of bulletins on methods of eradication. A few general principles may be laid down which may make clear why there are so many failures and so little faith in the methods given in the bulletins for the cleaning up of the weeds from our fields. A careful study of the plants, the mode of growth and propagation, is absolutely necessary in order to apply these methods successfully. With a thorough knowledge of this kind, there is scarcely a weed in the State that can not be readily destroyed without great expense during a single season.

Annuals.

Annual weeds, like the Russian thistle, tumbleweed, star thistle, cocklebur and the like, are propagated only by seeds and these seeds are disseminated in different ways; some by the wind, some by growing with grain and thus scattered wherever the grain is planted, some by the winter rain swelling dry creeks, and others are distributed by means of the harvester. These can all be destroyed by preventing the weed from maturing its seed and by careful seed inspection.

Perennials.

Perennials constitute a more difficult class to treat and may be divided into two classes. One class is propagated by seeds and roots and the other by seeds and rootstocks. A very careful distinction should be made between roots and rootstocks. The common wild morning-glory or bindweed, called also field bindweed (*Convolvulus arvensis*), is

propagated by seeds and roots, while the hedge bindweed (*Convolvulus sepium*) is propagated by seeds and rootstocks. The most prominent weed propagated by seeds and rootstocks is Johnson grass (*Sorghum halepense*). In both classes the propagation by seeds can be prevented by destroying the growth above ground before the seed ripens. The best time for the destruction is just before it blooms. In both cases in the eradication of these plants, the best method takes no heed of the seeds. They are destroyed with the destruction of the plant. Take the field morning-glory growing from the root system for an example. Whatever may be said in regard to the impossibility of killing this weed, it can be completely destroyed in one season. At least, it can be brought under perfect control by preventing foliage growth. The root of this plant contains a large amount of starch its entire length. This starch is the food which nourishes the plant in its effort to grow above ground. In its attempt to grow and get to the surface, it consumes a portion of the starch nearest to the growing point and begins to exhaust the starch. If on reaching the surface, the plant is permitted to grow so as to have any foliage, the work of replenishing the starch begins with the unfolding of the leaf. The time to destroy this plant is when the leaf begins to unfold. This prevents the addition of new food. This process should be continued an entire season, as often as once a week, allowing no new starch to be stored in the root, when the old starch will become exhausted. This is simply common sense applied with understanding. It has been done and can be done again. This work can be done by a good weed cutter.

The best example of the rootstock system is Johnson grass. The method of eradication of this pest has been fully worked out by Bulletin No. 279, by the combined work of J. S. Cates and W. J. Spellman of the Bureau of Plant Industry at Washington, after many years of study. The principle on which this weed is destroyed is based upon the fact that when the rootstocks are left undisturbed in the ground and no growth above ground allowed after the time of blooming, no new rootstocks will be formed for the next year's growth. It should be carefully noted, however, that in order to destroy this growth, it must be severed below the crown not much before the blooming period, because in forming the blades of grass in that luxurious abundance which precedes the formation of the flower stalk, it so exhausts the foods stored in the rootstocks, that it is incapable of sending up any more growth. If cut too soon after the grass has appeared above ground, another effort will be made to produce seed. If allowed to grow after the plant has blossomed, then new rootstocks will be formed for next year. Hence, the right time must be taken to kill this growth.

Soil and Field Conditions.

In the destruction of some of these noxious weeds, it is absolutely necessary for complete and speedy success to note carefully the soil and field conditions. With a full knowledge of the habits of the plant and the application of good common sense to these different field conditions, Johnson grass, supposed to be the worst of noxious weeds, can be brought under complete control in one season with comparatively little expense. With the severing of the growth above ground from the rootstock below the crown two or three inches below the ground, twice or possibly three times during the growing season, the pest can be brought

under control, while, with the morning-glory, it may have to be treated twenty-five to thirty times during a season in a similar way.

Thus we see that the noxious weed problem is a very complex one and requires for its solution an intelligent and careful preparation. So far-reaching is the influence of the solution of this weed question that it should become a distinct part of the work of the State Horticultural Commission. County commissions and bulletins have done but little in this direction, and they never will do much till the whole matter relating to weed destruction is taken up by the State. [Applause.]

THE CHAIRMAN. Do you wish to discuss Professor Chase's paper?

MR. HICKMAN. That weed question is sometimes or generally overlooked. Weeds are like some pests. You all, without doubt, have read the methods pursued in European countries—Germany in particular—as regards the introduction of pests. Every school is provided with specimens of pests. Now, here in California, we are likely to have anything under the sun in the shape of a weed importation. I well remember my first recollection of the common May weed, and I spoke of it to a friend and to neighbors. What little I did amounted to nothing, but for years the late pasture fields were a mass of May weed, and no use could be made out of these fields. Now, one field on a place may be infested with a weed that will not grow another weed, but it may produce such an effect that the field is absolutely valueless. I do not know that I am touching on Mr. Bowman's work. Am I touching on your work, Mr. Bowman?

MR. BOWMAN. No. Nothing will touch on it. [Laughter.]

MR. HICKMAN. Referring to the morning-glory: That part of the paper is particularly good, I know, and I have prevailed upon the Spreckels Company to undertake the reduction of it, for the simple reason that we wanted to prove to the people of Monterey County that it can be done. I know it can be done; I have done it myself. The work can be done in some three to five months, if properly handled. It must, of course, be persistently done, and no fooling, and that is the long and short of that thing.

I have been troubled on my own place for years with a weed of the pea family; I can not think of the name of it; it grows everywhere and simply takes the whole bottom land. This year in my work afield with the Russian thistle I came across it in scores of places where it had taken the choicest of the soil and made a dense growth. I could go on and mention dozens of weeds that had become very troublesome. We have plants that grow anywhere up in the high hills, but this year they have developed tremendously in the low land. To give you a little idea: There was a tobacco tree that stood in the road between the bridge at Watsonville and the old road going in toward Gilroy. There were certain trees deposited there in March by the flood.

I was working in the Salinas Valley trying to eradicate the Russian thistle, and when that flood came it brought Russian thistles down the San Benito River and deposited it on my ground. So I have another infestation.

This side of the work all points one way: Something should be done to make our people familiar with the plants that are likely to become troublesome weeds. The University can do a great deal in that line.

MR. CHASE. There is one point to which I wish to call attention. We must have a thorough inspection of our seeds. The morning-glory

is very commonly used for chicken feed, and it is distributed everywhere, and when you once get the morning-glory started it is very troublesome, but you sow it yourself. That is a very important statement.

MR. BLOOMER. This Johnson grass question is one that requires a great deal of thought and study. If we look back in the past we know that the United States Government recommended the planting of Johnson plant seed for forage purposes; and now we have Professor Chase come out with a bulletin and tells us how to eradicate it. The eradication, as I understand, means destroying and annihilating; but if we follow the system that he advocates, of cutting off two or three inches below the surface of the ground, we are not eradicating; we are only promulgating, we might say. We have got to cut that root out; we have got to burn it out, and when we do anything else we are not doing our duty. We can not do this work halfway and be successful. We have tried this long enough, this halfway on Johnson weed. We have to burn it up and not throw it on the county road and scatter it all over and have it a nuisance, so that we have to go back and keep inspecting the same ground. I have men in my county who have dug it up and burned it, and to-day they have not a piece of Johnson grass on their ranch to my knowledge. I am glad we have reached the point where we know what we are doing, and we will do it just one way—we will dig it up and burn it up. In small patches where it is, ten or fifteen acres, we had to plow it and burn it up. I tell you I am convinced there is only one way and I have told my inspectors that there is only one way, that Mr. Chase is not an inspector of mine, and he does not have Johnson grass in his section, but in the other parts of the county we have probably six hundred acres, and on about 150 ranches there are about a dozen places where there is anywhere from five up to a hundred acres, but on the small places we have only one system, and that is the only one I will allow. I won't have any halfway business about it. I want that infection stopped as soon as possible. I would like to hear others along the same line that have had experience with it.

MR. WILSON (of Fresno). I have had a little experience myself in handling Johnson grass in the river bottom where it is moist, and I want to say right now that if you expect to get rid of Johnson grass you have to plow it for two or three months, and you have to hire some labor and dig up the roots and burn them up, because if you leave them in the field they are going to grow and it costs a great deal of money.

The Johnson grass proposition depends on the standpoint and the country you are located in. Two or three years ago I was in the East and stopped at Montgomery, Alabama. I asked a lady there what kind of stock feed she had there in the winter. She said, "I have a fine field of Johnson grass." I said, "What kind of feed is it?" She said, "It is very good feed." I said, "Aren't you afraid it will cover your whole plantation?" Her answer was: "I wish it would do so." I said, "That is singular; I have been fighting Johnson grass and I want to get rid of it." She said, "Why do you want to get rid of it?" I said, "It is a very poor feed with us. The cattle will not eat it; a hog will eat it—eat the roots; it makes good hog feed, but I would not like to grow that on land that is worth a hundred to a hundred and fifty dollars an acre."

I want to tell you a little story: Professor Sanders before he came to our county was an advocate of Johnson grass; afterwards he was accused of a very grave crime. We got a farmer on the jury panel and he was asked, "Do you know the defendant in this case?" He sort of hung his head; he said, "Is that the man who introduced the Johnson grass in this country?" The attorney said, "Yes, I believe it is." "Then," he said, "I want to get a chance at him."

Since we have had that, I call it the plague, it is worse than the customs law to an orchardist. The only way to get rid of it is to plow it once a month, in June, July and August, and hire a man and dig out the roots and burn it. I have not got rid of it yet, and I have been fighting it for a good many years.

MR. STUART. I do not want to prolong this discussion. I think it is consuming too much time, but I want to say one word in regard to the efforts to, not eradicate, but to control the Johnson grass. I have some down in my county; I wish I had not; but I had read some of these reports, and I thought that I would experiment a little; so I had a man cut some on about an acre of it; and he went to the cutting-off process. He kept cutting off any time any would show up. I think he did that from the first of May to the first of December last year—kept cutting it off, and his instruction was to cut it off from four to six inches below the surface. Last December he quit. In last June, the following June, I had just as good a crop of Johnson grass on that acre as though the man had never looked at it; and I am thoroughly convinced that the only way to eradicate or control Johnson grass is to plow, harrow, and destroy all the roots you can possibly find and destroy them with fire.

THE CHAIRMAN. We are going to have this same subject up to-night, and inasmuch as we have Mr. Jeffrey here with us this afternoon, and he has consented to talk to us, and inasmuch as this protective league is a matter of great importance, I think we had better stop this discussion now; and if any one of you wants to take it up further, to-night will give a good opportunity; and with your permission I will take the liberty of calling upon Mr. Jeffrey, who will talk for a few minutes.

MR. J. W. JEFFREY. A few weeks ago I was asked by a mass meeting of fruit growers at Placerville to take up a special department of the work which we have had under consideration for two years, and that was to be called the work of organizing a league. A week or two after that there was a little meeting called at Sacramento, to which everybody was invited, but only about twenty-five or thirty responded; and at that meeting they ratified the work in a more general way; and the best part of it was, they raised \$1,200 in cash at that meeting, and that \$1,200 was to be expended, or whatever was necessary, in the work of organizing this league. The money was subscribed that afternoon. Mr. Stephens came in just after the subscription list closed, but he says he is going to do his share and I know he will. This money is to be used in organizing the league. Of course, the platform of the league is not fully worked out. I have had a thousand circulars printed, of which I have a crumpled copy here, giving an outline of what we expect to accomplish in this league. When the league is formed, and the executive committee is chosen, this plan may be modified and changed and improved, and perhaps other things added that are not thought of

now; and when the league is under way we hope to have everybody's support as a permanent institution.

In order to fill in the time I will just make a brief outline of the purposes of the league, as we have not very many circulars to give out generally, and discuss each point briefly.

The first object of the league, as set forth in this prospectus, is the organization of growers and shippers' unit in each district—into units, devoted to the improvement of the fruit pack. There are many, many fruit growers of the Sacramento and San Joaquin valleys who believe that this one point carried out properly by the league will justify the organization; this we have called standardization, and at the meeting at Lodi yesterday, which was called to meet two weeks ago, but had to be adjourned on account of another meeting, that meeting indorsed the proposition of standardization of fruit, without a single dissenting voice. They disagreed on the way to get at this, but they all indorsed the standardization of fruit and the organization of the league.

This standardization can not be secured without some direct and authorized plan, and that is what we have tried to adopt in San Joaquin County, Tehama County, Shasta County, in Placer County, and in El Dorado County.

Now, this is what we call the authorized plan, the plan that is backed by both the growers and shippers, the plan that will prevent the shipment of fruit that does not come up to standard, a plan that will put the inspection into the hands of disinterested inspectors. This plan should be secured, and the organization of these units, which will be started in several places, is to become the unit of the support of the protective league; and these units will also be made the source of permanent revenue for the league. For the first year we are succeeding in raising the money by voluntary subscription. As I stated, \$1,200 was subscribed at the first meeting. Other money has come in rapidly for the first year's organization, and there are other pledges out. The county growers are all taking it up, the exchange growers and the distributors and others, and we expect to finance this institution the first year on a voluntary plan. The second year we expect to have the units organized, and have the league supported on an acreage and carload lot basis; that is, the shippers and growers come in on these two plans. The acreage and carload assessment plan will support the league for the following year, if it is worthy of being maintained. Two years ago, when the Payne-Aldrich bill was being agitated and discussed, there was a party of Lodi grape growers that came to Sacramento and tried to get the legislature or somebody to bring up the matter of tariff on the grapes, and tried to maintain that tariff. This committee had no machinery to work upon. It was simply a committee of grape growers who got into a desperate fear that the tariff would be removed, and knowing the Tokay grape business was not very prosperous, they came to Sacramento and asked the legislature to indorse a resolution to congress, asking congress to get in and prevent the taking off of the tariff on Tokay grapes. This was the only recourse that the people of Lodi and San Joaquin County had. They had no organization. You have no organization in the north, and if the tariff on raisins or prunes or any other dutiable fruit is in danger, you have no method of expression; you have no method of representing your interests in Washington City. Now, an interest capable of putting up 15,000 carloads of fresh fruit, thousands

of carloads of canned fruit, raisins, prunes, and all other kinds, should have some organization through which it can appeal on matters touching tariff or freight.

Whether you are a Democrat or Republican or what not, you know that if the tariff is to be maintained on steel and other commodities the farmers must have what protection they can get, and it is now the purpose of this league to be able to put up arguments, and to do everything that is legitimate to convince the congress of the United States that certain lines of fruit ought to be protected.

The citrus growers in the south are ready for this proposition. When the Payne-Aldrich bill came up they had their men, their attorney, and they had a committee of two or three men there; they kept them there; and the tariff on oranges was left where it was, at one cent a pound, and the tariff on lemons was raised half a cent a pound. Whether you want your tariff raised or not, it matters not; you want it to remain where it is. It will be one of the objects of this league to have a strong committee to represent your interests on the tariff question.

Then there is the question that Mr. Stephens has been struggling with for years — the traffic question, especially freight rates. I see this morning that the Southern Pacific has promised to reduce the rates on deciduous fruits in the south. This will be very good if it carries out this promise; but we need to give Mr. Stephens a little help in getting the reduction on freight rates on deciduous fruits.

I heard one of the committeemen connected with the Citrus Protective League say that he and two others appearing in Chicago before President Ripley of the Santa Fé, and then going on to Harriman and interviewing him in New York, had secured a reduction of ten cents a hundred on oranges, which netted to the growers of the south \$700,000 a year — saved them that much freight. This was general, because these three committeemen represented 90 or 95 per cent of the citrus fruit industry of the State — because they went there with the data and arguments, because they went there ready to convince Mr. Ripley that he ought to reduce this freight rate in justice to the interests which were able to put up such a tonnage to be carried by the railroads.

Now, the point is this: The citrus fruit growers have been for years struggling with this same proposition, sending men, individuals or committees, representing the Exchange, or representing the Citrus Union, or some prominent shipper; but when they went there representing all of the citrus industry of the State — say 95 per cent at least — Ripley listened to them and Harriman listened to them; and they came away with a reduction of ten cents a hundred on all the citrus fruit shipped since that time.

This traffic question could be handled if we had the machinery and means to collect this data. I believe Mr. Stephens has laid out anywhere from two or three to seven or eight hundred dollars in the last three years to publish data upon the freight rate question. This ought to be done by some body of men who have the money to pay, and not lay the burden on one man because he is willing to do it; and all join together.

Then, there is another problem: That is the problem of unfair competition. There is no calling on the face of the earth that is so subject to unfair competition as that of the farmer. I was talking to a banker the other day and asked him what right he had to go into the cultiva-

tion of oranges. He had a large orange ranch up here. He said, "Why; haven't I a right?" I said, "Certainly you have; that is a kind of a joke of mine; you think it is all right for the bankers and business men of the country to compete with farmers. Your chambers of commerce are always trying to get people to come in and compete with the farmers. Supposing they should get another drug store on this corner, and another bank over there diagonally opposite your bank; they would soon go out of business; but they are doing the same thing with the farmers."

Now, it is all right to develop a country, but the mere getting of a large number of people to come and go into the fruit-growing business, I believe, is retrogression. I think they had better go slow and get people who are capable of growing and who will not be a detriment to the market in which you are engaged with your strength and capital; and the competition this class of people brings to you is not fair. I do not believe there is a motorman in Sacramento but what has a little farm. They are in competition with you. They have a right to be, but it is not a good policy to encourage the whole United States to come in here and compete on that basis; because after a while we are going to have an overflow unless they have the ability to help dispose of that product at the same time. This unfair competition would be directed or controlled somewhat by the league in every way in which the development of the State should be directed in reasonable lines.

I heard Mr. Stephens say at the Watsonville convention that it was folly to plant Tokay grapes, because the business was going to be overdone, and that common-sense talk could be promulgated by the league. I persuaded a man not to plant any grapes on his place and he told me that my reasoning was good, and he is not going to plant any Tokay grapes. He is going to plant clingstone peaches, which may be overdone, but as yet they are not overdone. The league could put out literature that could help the horticulturist of the State in a more reasonable way; and you can see that it is time that somebody stood in before the land promoter, the man who simply planted his land to fruit trees in order to sell it. Merchandising land as land is all right, but to stick out a lot of grape settings over a piece of thin soil just in order to sell that soil is wrong; and it is going to be detrimental finally to the very life of the fruit industry of the State.

I believe that the farmers have a right, Professor Cook, to direct scientific investigations of this State. In one of our institutions established at Whittier there is a clause in the law stating that the farmers had a right at the beginning of each year there, to get together and suggest to the board of regents of the University what particular line of research work and investigation should be taken up by that institution; it is part of the law, and I believe the farmers themselves, through some such organization as the league, ought to have the right to suggest to the University authorities and the Department of Agriculture at Washington what lines of work they ought to have done, providing it does not interfere with the purposes and policies of the University and the Department of Agriculture. Let that be understood; if the University has all its forces employed in a particular line of work, it ought not to be interfered with; but if it is undecided whether it ought to investigate the pear blight or thrips or eelworm; and the farmers have a preference, as I said before, in regard to the necessity of pear

blight work, the farmers ought to have the right to suggest to the University and the Secretary of Agriculture that pear blight ought to be investigated. That does not interfere with any policy the University has, because every institution should govern its own affairs at the final analysis. The league has some means of putting out information of a statistical nature: The number of acres in peaches, apricots and prunes; it should have some means of telling something of the market and crop proceedings and various things of that kind, and these statistics ought to be published.

Now, there are very few other matters that I wish to refer to, but one is the labor problem — farm labor problem. That is a very serious problem, and that is one that ought to be considered by the farmers through some business organization of their own, and I believe that standardization of fruit properly carried out all over the State will do more to solve the labor problem than any other one proposition; because it is a fact that if you raise the quality of your fruit and do not permit poor qualities to be sent out, it is very questionable whether Japanese or Chinese can raise fifty-dollar-a-ton cling peaches any cheaper than the white man. I tell you, if you put the work into your agriculture, the higher the quality of your products will be. If you see what the Japanese put out in some of their orchards sometimes — and the Chinamen and the white men, too — you can see that they must produce a low grade of fruit. The trees will produce it themselves for a while. But if you put your brains and money and everything you have of value into your business, there is not such a difference between Oriental and white labor as there is under present conditions; and I believe if you want to increase and solidify and make sure of the quality of your farm labor, you want to raise the quality of your fruit and send out nothing but the best. You will have more profit and be able to pay better wages, and that may in a measure be able to solve the labor problem. I have talked long enough.

THE CHAIRMAN. I do not see anybody asleep. I think they are all interested.

MR. JEFFREY. Now, this is the last time I will have the opportunity to address this crowd — “this bunch,” as you say sometimes — on the matter of the league. I will say briefly that the league is an assured thing now, and we want your assistance and support.

I told the people at Lodi yesterday that I did not want a man that would vote in favor of organizing a unit of the league at Lodi until he would stop and think a moment — “will it pay me in dollars and cents to have this institution?” Now, pause a little while; now, if each of you think it will pay you in dollars and cents to have this league organized, then let us have your vote; and if not, vote the other way. The matter was carried at Lodi unanimously, and they not only agreed to the organization itself, but they agreed to get up their part of the money without any further agitation on the part of any one, and send the money to the executive committee all together, whatever it would be.

Now, I want to tell you all, to make the same statement to you: If this league, as briefly outlined, means something to you in dollars and cents, support it; if it means nothing to you in dollars and cents, do not have anything to do with it; because we only want it to stand on its merits and to be organized on its merits; and if it can not stand that way, it should not be organized. We have a league in the south that we

know is of vast benefit to the citrus industry, and we would like to have one formed in the north, which would be of as great interest to our fruit growers.

We all know that one great trouble with the deciduous fruit growers is that they are not acting together on any proposition, and there will be scores of important matters to be taken up by the league. For example, the Panama Canal will soon be finished, and when that great work is completed it may bring about a total readjustment of the propositions affecting California, both upon her perishable products and upon all the traffic that she has from this State. Now, if the building of the Panama Canal is going to have some effect on the freight rates of the country, why should not the deciduous fruit growers form an organization that will have something to say about the traffic matters when they are readjusted and also pending the time they are readjusted, and have your say in a united way; and I believe, if you go into this organization, that there will be at least a score of very important problems to be worked out of service to yourselves, that can be elaborated by this league. And I wish, in extending to you an invitation to join it, if it should come into your neighborhood, to say that the men who are behind this matter are in earnest; I believe they will stand behind the organization and help to run it to the benefit of the grower; and I will say further, the great shipping firms, the distributors and the exchanges have said that they did not care to have anything to do with the management of the organization. They are willing to contribute the money, and to allow the growers themselves to appoint the executive committee and manage the business in their own way. I believe that is true, that everybody is willing to leave it entirely to the growers to manage through the organization they will form. I thank you for your attention.

MR. STEPHENS. I would like to make a few remarks in regard to what Mr. Jeffrey has said. There is one point in his address which I believe is of great importance, of great importance to you, and probably the greatest of all, and that is, that you are not organized. You must take into consideration, ladies and gentlemen, that you represent an interest and the only interest of paramount interest that is not organized. You can not go into this city, you can not mention any great interest but what is organized. Take the retailers; they have a common price. He spoke of the landed interests, of the chambers of commerce, of the railroad interests, and the different interests that have been at work from the early peopling of this State until now, who are continuing their labors to bring people here to enter into competition with you. I do not object to that. We want to people this State; we ought to have a million more people here, and we should have a million more, provided your work was handled with profit to you.

THE CHAIRMAN. We will have to stop this discussion a moment. Mr. Roeding wishes to go, and wishes to speak to this resolution, and if you will excuse me, I will wait a moment and put this resolution that Mr. Roeding is interested in.

MR. ROEDING. The resolution that has been handed to your committee on resolutions has been prepared with a great deal of thought by a number of the members of this organization in a conference over the wisest thing to do. It is in connection with the new national quarantine bill that is now pending, and reads as follows:

WHEREAS, There is now pending before congress Senate Bill No. 2870, and House

of Representatives Bill No. 12,311, pertaining to a national quarantine of plants; therefore, be it

Resolved, That the Fortieth California State Fruit Growers' Convention, assembled in Santa Rosa, California, December 21, 1911, does sanction the provisions of said measure with the following amendments, to wit:

A provision which will allow the proper authorities in California to inspect all mail shipments of trees, plants, fruits, seeds, scions, buds, grafts, bulbs and flowers coming into the State, and also the baggage of travelers.

And urge upon our Senators and Representatives to use their endeavors to procure the passage of same.

THE CHAIRMAN. We would be glad to hear from you, Mr. Roeding, on this resolution.

MR. ROEDING. I think that I have already expressed myself just as much as I would be expected to this morning. I do not think that I can add anything more to strengthen what I have already said. We all appreciate what the fruit interests are in this State, and I do not wish to take up the time of this convention by saying more emphatically than I have already said why I think this bill should be passed or should have the indorsement of this convention — this resolution, rather.

It will do more, in my opinion, to protect the fruit interests of this State than any other one thing. I know that Mr. Jeffrey, during the time that he held the position of Commissioner of Horticulture, repeatedly tried to devise means of trying to keep out the insect pests, and he did not have the funds to carry out the work as he wanted to do it. And I do not think any state organization, not only this State, or any other state in the United States, can carry this thing out alone; and we must depend upon the National Government to put this measure through; and I think that this State ought to take the step to see that this measure is put through, and I hope this resolution will receive the indorsement of this body.

THE CHAIRMAN. Are you ready to vote?

THE CHAIRMAN. All in favor of this motion will say aye. Opposed no—no use putting it. That is unanimous, Mr. Secretary.

MR. BEERS. In connection with this same action, we have a similar resolution, with exactly the same whereas and therefore, but following, "and we request our legislature now in session to memorialize congress, urging the passage of the bill." I respectfully urge the adoption of this resolution.

HOUSE. Second the motion.

THE CHAIRMAN. I suppose you all know they have done it; they have passed some very hearty resolutions and have ordered them to be sent not only to the members of congress from our State, but also to all of the executives of the several states, and also the authorities of horticulture. That being the case, do you want to pass this. There will be no harm. All in favor say aye, opposed no. The motion prevails unanimously.

MR. BEERS. If it is the will of the convention, your committee would like to furnish its report at this time and be discharged, if we may present the rest of our resolutions.

THE CHAIRMAN. If there is no objection. We will then hear the rest of the resolutions.

WHEREAS, The citizens of Santa Rosa have so cordially placed their beautiful city at the convenience of the Fortieth California Fruit Growers' Association for their annual session, and have labored so diligently to make our sessions successful and comfortable; therefore, be it

Resolved, That we extend to them our cordial thanks for the same, and especially to the Chamber of Commerce, to Mr. E. H. Brown, Mr. N. J. Newcomb, and our personal host, Commissioner A. R. Galloway, for their untiring efforts, without which our convention would not have been so fruitful in valuable results.

Resolved further, That we express our appreciation for the good taste and will of those who have decorated our assembly hall, and for the excellent music that has enlivened our sessions.

THE CHAIRMAN. All in favor of these resolutions as read say aye. Contrary no. The motion prevails.

MR. BEERS. That finishes the work of your committee.

THE CHAIRMAN. The committee is discharged.

MR. ———. In relation to the quarantine, I would like to add a few words: That Mr. Roeding, who is not only a nurseryman, but also a fruit grower, suggested that it would be wise to send a man to Washington. I feel that we can indorse that, and I would move that we, the convention assembled, will hereby appoint Mr. Roeding of Fresno and Mr. James Mills of Riverside as our agents to go to Washington to be our representatives.

MR. BEERS. I desire to second that very heartily.

THE CHAIRMAN. All in favor of the motion say aye. Contrary no. The motion prevails, and those gentlemen are appointed. Now we are prepared to go on with the discussion.

MR. PHILLIPS (of Fresno). I have listened with a great deal of interest to what was said by Mr. Jeffrey on the question of table grape growing and also as brought up by Mr. Stephens, and I can heartily indorse all that has been said by both of them. I want to say to Mr. Jeffrey that we hope he will come down there and organize at least a wing or a branch of his organization in the county of Fresno. I believe I can say without boasting that our county has as many table grapes growing as any two counties in the State. I want to say now that I want to become a member of that league, and I want to do all I can to aid in the organization of that branch. I think it is a good movement and is worthy of indorsement by every table grape grower in the State of California.

THE CHAIRMAN. That is a good talk. Has not somebody else something to add in the same line?

MR. ORENSEN. We can only get united action by organization.

MR. WILSON (of Merced County). As Mr. Jeffrey goes to Fresno we would like to have him drop off at Merced and form a branch there.

THE CHAIRMAN. Is there anything else?

MR. BEERS. I would like your attention a moment: I would like to invite you to Santa Barbara to the next annual convention. Some of you are not aware that those of you who were here this morning decided to go to Santa Barbara, and I invite you all to come to Santa Barbara for a pleasant stay.

THE CHAIRMAN. And also the annual meeting will be at Fresno, although that is a little doubtful, because it may be that the convention will change it. Is there anything that anybody thinks of? Ladies and Gentlemen, I want to say one word: It seems to me we have had a very pleasant, harmonious meeting, and I am very grateful for the cordiality you have shown me, and I want to thank the people of Santa Rosa for the decorations and music and other good things. Now we stand adjourned, to meet June 12 to 14 at Santa Barbara.

EVENING SESSION—THIRD DAY.

Commissioner Bishop as chairman.

THE CHAIRMAN. The first question on the program is the Noxious Weed Problem, and Mr. Bowman has been selected to handle this subject.

MR. BOWMAN. Gentlemen, I guess you are all tired of this noxious weed problem, but I thought I would bring it before the commissioners and have it settled one way or the other.

THE NOXIOUS WEED PROBLEM.

In presenting this paper upon the noxious weed problem, the writer is extremely doubtful of presenting any new or startling facts. It may start the ball of discussion rolling, however, and thereby accomplish some good. To begin with, then, we will take

Johnson Grass.

To mention Johnson grass frequently brings a smile from the uninitiated. In Placer County, where we grow everything from a snow plant to a banana tree, we have, in spots, a never-failing crop of Johnson grass, and it is far from being a laughing matter. The Horticultural Commissioner, being threatened with annihilation and extermination if he did not at once and forever remove said Johnson grass, singly and collectively, from the county, an investigation was begun, with the following findings: First, to dispense with the bulletin already written upon the subject, a paper that no doubt all of you have received, and which was written for the purpose of explaining conditions as they existed in our county, I will state the summary. Placing a summary before the body of a publication, as practiced by the Geneva, New York, experiment station, is commendable. We may read the summary and let the rest go, as we frequently do.

Summary of Johnson Grass Conditions in Placer County.

Johnson grass is a pernicious perennial, planted in Placer County twenty-six years ago. It is confined, at present, almost exclusively to properties where originally planted. Its dissemination from seed is extremely slow, and this method of infection is not to be feared by any one acquainted with its habits. Furthermore, if property owners thoroughly understand its nature, no trouble whatever will be experienced, even though their irrigation water runs through ditches lined with the neglected grass. In support of this I will cite two of the several cases appearing in the bulletin.

Case No. 3. An orchard of twenty or thirty acres is situated within 150 feet of a forty-acre tract, every acre of which is more or less covered with Johnson grass. The twenty-acre orchard is irrigated by water which flows through part of the infected property. Johnson grass is growing along the banks of this ditch and seed falls into the water and has been falling into the water for years. The writer gathered several handfuls of seed along this little ditch, all of which would have eventually fallen into the water and have been conveyed to the unaffected property of twenty acres. *Not one blade of Johnson grass is to be*

found in this twenty-acre orchard, and there never has been seen a single plant on the property.

Case No. 4. In one part of the county there is a railroad culvert three feet high and three feet wide. The water runs through this culvert at quite a grade. On the upper side of the track Johnson grass is growing right up to the mouth of the cement. On the lower side the water spreads through orchards, vineyard, woodland and pasture, disseminating seed continually. This condition has existed for years. Careful search will fail to discover any Johnson grass whatever on the lower side of the track.

Rootstocks are the principal means by which the grass is spread through an orchard, and should be ever guarded against. The citation of these cases could be prolonged indefinitely, but the above will sufficiently illustrate the fact that Johnson grass is not readily transmitted by seed from an infested property to a cultivated orchard. At least, it does not materially increase in this manner. All property that has been infested by seed was infested years ago, when no one knew or cared whether the grass was dangerous or not. These numerous cases also prove that it does not require eternal vigilance to prevent seed infection as some would suppose.

It must not be supposed that we wish to make the assertion that Johnson grass can not be disseminated from seed nor must it be supposed that we advocate allowing it to form seed in any situation. If for no other reason than the fact that rootstocks are principally formed after the plant has blossomed, the grass should be regularly mowed. This should be insisted upon.

The horticultural commissioner has not as yet enforced the law in regard to eradication, for the reason that no support and no coöperation has been given from those immediately concerned, and under the circumstances he has not considered it worth the price, especially when the great cost and hardship to many has been taken into consideration. One should not be compelled to eradicate the grass unless all are compelled to do so, and to compel all to eradicate Johnson grass would cause great hardship and distress in many instances.

The craving for sympathy impelled the writer to appeal to all of the commissioner brotherhood of the State. They responded handsomely, and although the permission has not been given, we will take it for granted that their answers may be freely quoted. Johnson grass is at present, growing to a greater or less extent in every county having a commissioner in the State, and, presumably, in many of the other counties. Napa and San Benito counties are the only ones heard from in which the commissioners state that it has not been met with. This widespread distribution may be the result of seed infection through the waterways, as many suppose, but we are inclined to believe that a careful investigation will disclose the fact that, in a majority of instances, the grass has been planted on or near the infested spots. In Placer County I have not found a single infection worthy of the name outside of the original plantings. However this may be, the only practical method of extermination, with conditions as presented in most of our vineyards and orchards, is persistent, unremitting work for two seasons at least. This method as briefly stated by Mr. Cundiff of Riverside is as follows: "Where it is possible we plow deeply about the middle of

May, and again about the middle of July, to be followed by a thorough raking with an implement that will bring all of the loose roots to the surface, where, after drying out, they are burned. In orchards where the grass has become firmly established around the roots of the plants of course it will require the use of a spade or mattock to get the roots out. Conditions are more favorable here for the eradication of the grass than it would be in sections of greater rainfall, and the success we are having here might not apply under different climatic conditions."

This same method, slightly modified for our northern counties, is given by Mr. McBride, of Solano, as follows: "First, the regular spring plowing is done in April; second, plow about three inches deep — no deeper — about the 15th of May; third, plow about four inches deep — or deeper — about the 15th of August. No hoeing is required between plowings unless there are stray shoots that might be missed. The dates of plowing will be regulated by the development of the grass in every case." Mr. McBride states that the pest has been completely eradicated in his territory in one year by this method. We presume the property was non-irrigated. Professor Chase has pointed out the methods (embraced in Farmers' Bulletin No. 279) employed by him in Sacramento County, this land also, we presume, being unirrigated. This very same procedure is being carried on in Placer County; this year without water. It remains to be seen whether or not our slate and granite soil, where trees and vines are accustomed to regular irrigation from the time they are planted, will stand the pressure of drought until the Johnson grass gives up the ghost. Irrigation here is considered a positive necessity to success. I am almost convinced that with the usual irrigation in our soil and with our conditions the task of eradication is hopeless. In this connection the following from Mr. Lamiman of Shasta is pertinent.

In answer to the question, "Do you know personally of any instance where Johnson grass in orchard or vineyard has been completely eradicated?" He answers, "Yes, in an orchard by no cultivation and no water. Orchard about eradicated, too." So much for the eradication of Johnson grass. Just a few words in regard to its control, and I will have finished. As several complaints were received during the present season, the following circular was issued and distributed broadcast:

A Circular on Johnson Grass!

IMPORTANT.

Complaints are being received that parties are allowing this grass to mature seed to the detriment of their neighbors. It will be necessary to pursue a more strenuous policy against these offenders, and this circular is sent out as a general notice that those having Johnson grass on their premises must not allow it to mature seed. Legal notice will be served on any violators of this rule without previous warning. Some of our fruit growers hold the false impression that the horticultural laws can not be enforced. To these we would say that the Supreme Court has upheld the law in its entirety, that there has been no revision and that the act is constitutional in every way.

We earnestly request that the land owners will not force the disagreeable duty upon the Commissioner of condemning their places as public nuisances.

KEEP THE GRASS FROM GOING TO SEED AND NO COMPLAINT WILL BE MADE.

Eradication may be accomplished by keeping all irrigation water off the land to be operated upon, and by plowing and cultivating during the summer for two seasons. Mr. N. B. Lardner of Penryn has had signal success in this method of control, having greatly reduced the weed in one season. We do not expect orchardists to eradicate Johnson grass in difficult situations, but we do expect and insist that it be regularly mowed and that no seed be allowed to mature.

H. H. BOWMAN,
Horticultural Commissioner, Placer County.

This circular did not have the effect desired. The growers that were expected to respond by setting a good example treated the matter with utter indifference. One orchardist told the writer to go ahead and mow it. He said that the weather was pretty hot, and that he did not have the time anyhow. This brought out forcibly to our mind the absurdity and futility of attempting to force growers to mow their Johnson grass three, four or five times a year. As Mr. Pease of San Bernardino writes, "To keep it down for a year would require notices served a dozen times and when some of the infections are very small, you will see how many liens you would need to file for a small amount." To enforce control even in Placer County would require the constant service of several inspectors and a corps of mowers. Furthermore, I am convinced that the county would derive no benefit whatever, for reasons stated above, as regards the apparent difficulty with which the seed of this grass is disseminated.

It would be a relief to many of us I am sure, to be set right in regard to the legal handling of this weed situation. It is entirely different in every way from the insect pest and tree disease proposition, for the reason that a forced eradication of one of our pernicious weeds would virtually require occupation of the premises for two seasons in the majority of instances. Alarmists send in exaggerated complaints predicting ruin to the county unless immediate action is taken. Property owners, even those who are most able, financially, to stand the cost of eradication are indifferent, and the less fortunate grower would become bankrupt if compelled to clean *his* ground of the weed. We hold the belief that a commissioner is appointed for the purpose of aiding the fruit grower, and should not be expected to harass or distress him. With due apology, it seems as though a commissioner is placed between the devil and the deep sea.

I have pointed out in my circular on the subject that it is unnecessary and impractical to compel a general eradication. That statement is taken by many to signify simply a lack of executive ability, and even a disinclination to perform a plain duty. "If *you* can't do it, we better get some one who can," is an old but common expression.

I shall not take up your time with a discussion on the other pernicious perennials, such as Bermuda grass, Canada thistle, and morning-glory. The State and Government bulletins, besides the horticultural press, keep us fully informed in regard to the latest and best methods with which to deal with them. Concerning the noxious weed problem from the standpoint of a horticultural commissioner, I would like to offer the following, merely as a suggestion:

WHEREAS, There is at present growing within almost every county of the State of California, some pernicious perennial weed, such as Johnson grass, Bermuda grass, Canada thistle, morning-glory, or some such pest, the eradication of which through present known methods may be accomplished only by the greatest labor and expense; and

WHEREAS, These weeds have gained a foothold through no crime or offense of the owners of the property wherein found growing; planting of the same having been recommended in many instances by institutions of learning and other progressive bodies; and

WHEREAS, A great majority of growers would gladly rid their places of these obnoxious pests if practical methods could be evolved wherein the expense would not make questionable the advisability of attempting their destruction; therefore, be it

Resolved, by the County Horticultural Commissioners of California, and by the Fortieth California State Fruit Growers' Convention, That we, as county commis-

sioners, allow a specified time in which an educational policy shall be pursued in regard to the noxious weed problem whenever and wherever possible. This policy to involve instruction, persuasion and the gradual eradication, if possible, of these pernicious pests; and be it further

Resolved, That a copy of this resolution be sent to every horticulturist and agriculturalist concerned in the several counties of the State.

Such a resolution, if adopted, would show leniency and would give a fair chance to every one.

In the mean time we, as commissioners, may receive enlightenment. Furthermore, the adoption of this resolution would place us in a position, for the present at least, to defend our attitude without having to offer unprofitable explanations as to why we do not force eradication whenever called upon to do so. As I understand it, none of us are particularly anxious to take the initiative in this compulsory eradication movement, and, personally, I am strongly in favor of a uniform State system of handling these matters.

Let us at any rate take a firm stand and decide upon the *best* method and then let us all unanimously adopt and pursue that method. [Applause.]

THE CHAIRMAN. This discussion is to be lead by Mr. Wilsie of El Centro, Imperial County.

MR. WILSIE. *Mr. President, Fellow Horticultural Commissioners, Ladies and Gentlemen:* That paper shows to me what has come to my mind often, that the weed problem, the weed question of California, is not considered as it should be considered. From the standpoint of the horticultural commissioner, the law puts the Johnson grass just where it puts the red scale. Now, as to the advisability of enforcing the law, of course, we have our differences of opinion in regard to that, but we all believe this one thing, that it is a nuisance. Now, this is a fruit growers' convention, and all of the papers and all of the remarks at this convention have been along the lines of fruit growing. The county horticultural commissioner is not a commissioner simply for the fruit grower; although the fruit interests are the largest interests we have in the State, there are other interests that need attention just as well as the fruit interests. The weed problem does not concern the fruit grower as it concerns the grain grower, or the ordinary farmer. I do not think it would be wise for us as fruit growers to pass a resolution saying that we, as horticultural commissioners, did not believe in attempting some sort of control — of course, I do not understand that he meant no control — of the weed problem? Now, I want to say a word in regard to what I think ought to be done.

When these horticultural laws were first enacted, the first thing that was done was to quarantine against the insect that was supposed to be a detriment. It seems to me that the very same thing, the very same line should be followed out in the weed problem. The Johnson grass law or the weed law, as it is, is a specific law outside of the horticultural law, and takes the Johnson grass or the Russian thistle after the farmer has got it on his place. It allows the seed merchant in San Francisco or Los Angeles to make a profit on the Johnson grass that the farmer sowed, and after he has it growing, compels him to go to the expense of eradicating it. You can readily see that somebody has gained at the wrong end of the proposition. If we are ever going to control the weed in California, the first thing we have to do is to stop the indis-

criminate dissemination of the seed. I do not agree with Brother Bowman in regard to some things that he said, but I did not understand exactly what he meant.

MR. BOWMAN. I am talking for Placer County, Mr. Wilsie.

MR. WILSIE. I will say right here, so that you may all understand, that I am from Imperial County, the new county, the county that we started in ten years ago without a weed, absolutely clean ground. Now, we look at things down there different from what you people look at the weed proposition, because in these older counties we do not know the way that the seed has disseminated. How did we get the weed into our county if we did not bring it with the seed? The water has run in there; we have not any history when the Colorado River did not run there. We have the Johnson grass, the Russian thistle, the morning-glory, and the Napa thistle, and we have several other things that I might tell you about; but how did they get there? There is not a thing in there that we do not pretty well know where it came from. In every case it has come from one or two places. It has either come in the grain or the seed that was shipped in there for seedling, or it has come in the nursery stock, in boxes, or in the balls around the roots of the nursery stock. We have probably sixty farms in the valley that have Johnson grass. We know cases where it is in the alfalfa, with the sorghum and with other things. If we are going to do anything with the weed problem, we have to stop that. You do not notice it in the older counties, but if you ever get rid of it, you have got to stop seed being sold from one farm to another farm. The time is coming when we will have in California just the same law for handling seed that we have got to-day for handling canned goods, the pure food law; we will have a pure seed law. That is the place to begin. Make it obligatory upon a man that wants to sell seed in your county to put an analysis upon a package that contains the thing that he offers to sell, with the analysis of that seed. If it is alfalfa seed, let him say it is alfalfa seed, but if it has Johnson grass seed, let him say it is 99 per cent alfalfa seed and 1 per cent Johnson grass seed. Isn't that a good place to begin? We have analyzed a great deal of seed in our county. I will tell you one analysis: We took samples of alfalfa seed and had them analyzed by men that the State University recommended. One analyzed 73 per cent of alfalfa; then it was 40 grains to the gram Johnson grass seed. I have forgotten the percentage of Johnson grass seed. Then we took that same seed and had it analyzed for germinating power of the seed. Seventy-five per cent of that alfalfa seed grew. That was eighteen cent alfalfa seed. You can figure that out and see what the farmer paid for the seed, but that is another phase of the question. We have had barley shipped in there with Napa thistle, with Johnson grass, with wild oats, and several other smaller seeds. Now, my idea is that the law in regard to seed is not going to be changed; the horticultural law is going, I fear, to remain just where it is in regard to seed. It is not easy for the Horticultural Commissioner to do his duty, with impure seed to contend against, and the time is coming, and I hope it won't be very far off, when impure seed will be impossible, because that is what our county wants, and, by the way, it is a pretty good sized county. I had hoped that we might take up the question of a pure seed law at this time, but I got up here and found out that they were talking

about the other law, and they said the question would be settled in that law. The matter of seed is going to be taken care of all right, but the county shipments, the indiscriminate dissemination of the seed itself, I do not believe is going to be taken care of. I would have a law that it would be a misdemeanor to offer any grain or seed of any kind for seeding purposes that had any Johnson grass, any Russian thistle, any Canada thistle, any of the thistles, and include morning-glory. I do not believe it ought to be lawful to sell seed for seeding purposes with any of those seeds. I would make it a misdemeanor for a man to offer grain for sale for seeding purposes without the analysis of the contents of that

MR. COOK. The University does it.

MR. WILSIE. After that is done, any man in the State that wants to offer seed for sale — it is not any harder on the seed man to have an analysis made than it is for anybody else in any other line of business — he should have an analysis placed on the package; and if we ever get anywhere, there is where we have to begin. That is all I have to say.

MR. GALLOWAY. There is another very prolific way we found in this county of dissemination of seed that is quite as harmful as through the seed, and that is in the hay, the feed that is transported. Now, in our county there are hundreds of farmers, or, rather, orchard men that do not raise any hay. They get their hay from outside districts, thousands of tons are shipped from one part of the county to another, and from other counties into this county of foul hay. I think you will have to have a law for analysis of hay also.

THE CHAIRMAN. Texas has such a law.

MR. CHASE. I am very happy to note the tendency of this session. Mr. Bowman has read a very excellent paper in the right direction. He has been a very successful observer and given some very valuable points. He has made some mistakes. One point in particular I wish to emphasize; that is, in regard to not being afraid of the Johnson grass seed in the field where it grows. I have seen it just as he has said. Now, the reason of that is this: Johnson grass seed, when first planted, is just as easy to destroy as any other seed, but Mr. Bowman is mistaken from the fact that it does not become disseminated in his county. I had quite a fight with that. I have five acres of that seed which came in from the North Fork Irrigation District, which runs through a Johnson grass orchard in his county, and the seed came in in the water pumped out of the river. Every year it gets the seed. The Chinamen do not know it. Take Cosumnes: That was entirely free from seed except in one place until four years ago, when I think it was that they had great floods that washed away the banks. I will give you the name so as to be definite; Mr. Daniel Flint owns a ranch with a rather sandy soil and the water overflows and washes some of his soil, so he conceived the idea of using Johnson grass to make a wall, so that the water will not wash it away. He sowed it on the banks to protect his banks. When the flood came he had been growing it for years; he let it go to seed, and when this flood came, a thousand acres started all over that country clear down to the station, about four or five miles on both sides of the river; I guess there is more than two thousand acres of Johnson grass seed and the weed has come up so that some of them thought they would have to give up the land. I want to say to you in all candor that in our meadow land it is not expensive to get rid of

that grass. I know you can get rid of it if you never let it blossom in one year.

MR. BOWMAN. You stated that this reservoir broke away, did you?

MR. CHASE. No, the river overflowed and flooded the country.

MR. BOWMAN. Are you sure that it was not the rootstock?

MR. CHASE. Yes, but the seeds were there in abundance on the land. All the neighbors say they got it from Mr. Flint's orchard. The method was to prevent any more seed, so that when the floods came it would not be spread. On one side of the river they have a big levee. I am told there is one place above there that scatters the seed. All they do is to plow it up, and they are cutting it down and cutting it down. On such land as that you can do it with little expense, for Johnson grass, if you understand it and notice the rootstock, is nothing more nor less than potatoes in character. They are exactly the same, and neither of them grow until there is a certain growth above ground. A potato can not grow without buds, and if you cut down a potato vine early in its growth it will grow, but if you exhaust it, it won't grow. So, if you are careful to cut it down, and a knife cutter is good enough — I know a man cleared out a hundred acres in two years by just that method. He showed me how he did it. It was very interesting. Mr. Price says he had no trouble with it. If you have got Johnson grass and put it to pasture, the sheep and goats will eat it clear down to the ground, and there will be no growth of rootstock. In the fall you can tear the rootstock all up. I saw a piece plowed up where the grass grew six feet high. They mowed it down in the summer, plowed it in the fall, and let it lie all winter, put in a crop of barley and had an enormous crop of barley and wheat, and next summer he scattered Johnson grass all over. He has a new crop of Johnson grass. He was going to put alfalfa in, but he did not. If he had put in alfalfa, he would be getting five tons to the acre, but he did not take care of it and he has Johnson grass growing all over it. Take sheep pasture; you may pasture it ten years, and there will be Johnson grass there. It does not check it, but it brings the rootstock to within three or four inches of the top of the ground. If you shallow plow and let it lie there in the winter, you may plant any kind of crop you want to and you can take care of it. Now, that thing has been done in the south and in Texas on the authority of the best men we have, and that is the way they do it; I know it. So those two conditions, pasture land and meadow land, can be eliminated without any trouble. You try that. Now, here is a case where a pear orchard was full of it and instructions were given to plow the orchard and cultivate it. It grew, came up; the Chinaman got his cutter through; that did not do any good; it came up again. We must be educated or start a campaign. We have got to have an education. It is in the grain that they buy and it has gotten all over the State, and it is a very bad condition. That can be handled if we know just what we get.

THE CHAIRMAN. Is there anything more on this subject?

MR. HICKMAN. I would like to say that this thing ought not to go without some sort of a statement from this association meeting as to the attitude of these commissioners regarding a seed inspection law, and as to the weeds themselves.

MR. CHASE. We can not enforce a law so radical as that.

MR. MARSHALL. I just want to say a word about the Johnson grass trouble. This is the most intricate problem we have in our county. There were eighty acres sowed there and now we have thousands and thousands of acres. Some orchards have become so infested that the land had to be abandoned, and we think the law is very ambiguous. It was impossible to enforce the law. The seed is disseminated chiefly by the canals and ditches, and a new way of disseminating the seed has just come to my notice, and that is by doves. I know a man, a Mr. Humphrey, who owns 160 acres of orchard and vineyard entirely free from weeds. He irrigates from a pumping plant, and yet his land was infested last year and this year with Johnson grass, partly by doves across the road, and it cost him \$300 to eradicate it. So you see it is a very intricate problem. It is of much interest to me, and I would like it if this convention could do something in regard to getting the Johnson grass law clarified so that we would know how to act in the matter.

MR. McBRIDE. It seems to me that the subject of Johnson grass has received more attention than any other weed, and I wish to speak about two weeds that are bothering my county. The first is the Russian thistle, that has just entered the county recently. Where it comes from I do not know, but it appears along the Cedar Creek and above us in Napa and Lake counties. The other is yellow star thistle, and in our county we do not know what to do with it. It is ten times worse than Johnson grass, or more. There is one batch of alfalfa that is right in the midst of an infestation of yellow star thistle. This, I think, would come properly under Mr. Wilsie's suggestion that something be done with the seed law.

THE CHAIRMAN. If there is nothing else, I wish to say in passing, in line of Mr. Wilsie's suggestion, that I have some little weeds in my county, introduced in a section where we had comparatively few weeds, namely, the beet fields and celery fields, introduced by seeds—the hoary crest and the Canada thistle, small infestations that we know came in celery and beet seeds.

The next thing on the program is the "Shade Tree Insects," by Commissioner Volek, of Watsonville.

MR. W. H. VOLCK. Mr. Chairman, I have tried to limit this subject to a reasonable length, and on that account may have omitted some points, but those may be brought up in the discussion.

SHADE TREE INSECTS.

This subject is of interest to horticulturists, but is of greatest concern to the growers of ornamental plants and gardeners. A broader view of the matter must change the title to that of Shade Tree Pests, or better, Ornamental Plant Pests.

I might enlarge on the value of such cultures in maintaining more congenial surroundings for homes, parks and roadways, but these points are so generally conceded as to make such discussion unnecessary.

In the first place, the question arises to what extent are infestations of shade trees detrimental to general horticulture. The public is familiar with an affirmative view of this matter, and at times disinfestation of shade trees and garden shrubs is enforced on the grounds

that a dangerous nuisance is being maintained. I wish, at the outset, to state that in the majority of cases such infections have no direct bearing on the condition of commercial orchards.

There are certain exceptions, such as the case in which large trees overshadow an orchard. Peppers growing along a roadway may keep the adjoining orange orchard infested with black scale for a distance of several tree rows. Again, where the ornamental plants harbor a new pest, not generally distributed through the orchards, its presence may be considered a nuisance.

Then it is a matter of discretion and judgment on the part of horticultural commissioners just what disinfection of ornamental plants shall be enforced under the horticultural laws. It is evident that such discretion is in practice, judging from the prevalence of infested shade trees in most of the counties.

On the other hand, the owners of these ornamental plants desire that they should present a clean and thrifty appearance, otherwise their beauty is largely destroyed. It is to offer such suggestions as may be helpful in maintaining ornamental and garden plants in good condition that this paper has been prepared.

The insects to be dealt with belong largely to sap-sucking species with scales and aphids in greatest abundance. This type of insects require treatment with contact sprays or fumigation. A number of these sap suckers eject an excretion known as honeydew. On this sweetish substance the black smut fungus thrives. For this reason many of our shade trees and ornamental shrubs become badly smutted at some time during the summer.

The blackening of the foliage, and often the ground under the trees, is the most noticeable symptom of insect infestation. However, when it is desired to control such insects, the spraying or fumigation should be done before the blackening occurs, as at that time most of the injury has already taken place. A little close inspection will reveal the presence of green lice or scale long before the black smut fungus has developed. It is upon such inspection and the prompt application of a remedy that effective treatment depends.

The plant lice or aphids are responsible for a large amount of damage to ornamental trees and shrubs. These insects are readily controlled by dilute solutions of nicotine, nicotine and soap or nicotine and lye-sulphur. These mixtures make excellent combinations, for the presence of soap renders it more easy to wet the plants and the bodies of the lice.

For green lice (Aphids):

Soap (whale-oil or common laundry soap)-----	3 pounds
Nicotine sulfate ("Black Leaf")-----	$\frac{1}{2}$ gallon
Water -----	50 gallons

The soap is dissolved by boiling in a small quantity of water.

For Black Scale:

Increase the soap to 7 or 8 pounds, the nicotine sulphate can also be doubled to advantage.

This formula will be effective against all kinds of plant lice when well applied. The trees should be drenched, and the application must be repeated whenever inspection shows that the lice are becoming dangerously abundant. Some years one spraying may be enough, but other seasons climatic conditions will be so favorable to insect life that three or four sprayings become necessary.

In the case of the black scale and most other scale insects repeated applications are required. The old insects can not be killed by dilute insecticides, which are safe upon the foliage. The young are easily killed, but on account of prolonged hatching can not be controlled with one spraying. Systematic treatment every two or three weeks will keep all kinds of shrubs and trees free from the black and most other scales. In using these formulas, if there is any tendency to scorch foliage, reduce the percentage of soap to a point where no injury results. The amount of nicotine may be increased considerably without danger of injury.

When rose bushes and other plants affected with mildews are to be treated it is well to have some sulphur in the spray. Lye sulphide is a good form of sulphur to use. Lye-sulphur may be easily prepared by mixing one part by weight of granulated lye with one and one half parts of sulphur. A little water is added to start the reaction, which takes place without heating, or at most, only gentle heating. The mixture soon boils violently from the heat of the reaction, and so should be prepared in a vessel with considerable extra space to prevent boiling over. When the boiling has subsided, water to about double the volume should be added and thoroughly mixed. The mixture may then be filtered into a suitable container. Of this stock solution about one quart in 50 gallons may be used with or without soap, but of course containing nicotine in the proportions before stated. If there should be any burning of the foliage, reduce the lye-sulphur content.

Applications should be repeated whenever required. A point to be considered is that the systematic use of this formula every three or four weeks will prevent the occurrence of most insect and fungus troubles.

Numerous other contact mixtures might be mentioned, but I have confined my recommendations to nicotine-soap and lye-sulphur sprays, because of their general applicability and the fact that they may be effectively and safely handled by inexperienced people. Fumigation is a good method of handling pests on ornamental trees, but its application must be left to experienced parties.

At times the gardener may have to deal with chewing insects, such as caterpillars. These are usually too resistant to be killed with the contact sprays mentioned here. This class of insects is most readily controlled by the use of stomach poisons, such as paris green, arsenate of lead and zinc arsenite. The last named arsenical is probably the best poison for gardeners' use. It may be dusted over the plants dry or applied with water. As a liquid spray one pound of zinc arsenite is about the right quantity for 50 gallons of water, paris green one fourth this amount, and arsenate of lead as much as three pounds. All of these materials require constant agitation to keep the mixture uniform. Foliage injury may occur with paris green, but not nearly so frequently with lead arsenate or zinc arsenite.

Such insects as tent caterpillars and canker-worms may at times be troublesome on shade trees, and the live oaks are subject to defoliation by the California oak-moth. All such injury is easily prevented by spraying with a good arsenical poison.

The use of spray materials implies some sort of a spray pump. Good hand pumps are now on the market, and every one who has to care for ornamental plants should be provided with at least a bucket pump. A

good bucket pump that is quite generally handled by hardware dealers is known as the Myers pump. By closing the agitation vent at the base of the pump with a drop of solder, and attaching a 10 foot length of hose with a 4 foot extension rod bent near the tip at an angle of 45 degrees, and completing the outfit with a Bordeaux nozzle, a satisfactory equipment is obtained. One person can operate this pump, but better work is done when there are two people, one pumping and the other handling the nozzle.

The Bordeaux nozzle can be adjusted to throw various volumes and qualities of spray, hence is adapted for close and distant work. By using the full sized aperture and vigorous pumping a stream can be produced that will reach the tops of tall shade trees. A little experience will enable one to thoroughly spray such trees with this outfit, but of course the work is more cheaply done with power pumps. Indeed, it would appear that there should be profitable work for a small power equipment in cities and towns. Such an outfit need not cost more than \$150.00.

The one most important thing to remember about spraying is that it must be done thoroughly. The tree should be drenched and the spray applied from all directions. The 45 degree bend in the extension rod is a great advantage, as the direction of the stream can be changed by simply twisting the rod. To give some idea about the quantity of spray necessary I will state that large shade trees will require 20 to 50 or even more gallons.

Much more could be said about spraying, but I will conclude by mentioning a few other points which may be helpful. It frequently happens that badly infested trees are much better cleaned up if freely pruned. In cases where it is considered expedient to prune back severely and defoliate it is possible to use much stronger insecticides. Dormant or defoliated trees may be sprayed or painted with a strong soap solution made by dissolving one pound of soap in a gallon of water. This mixture must be applied hot, as it jells on cooling. Practically every scale insect will yield to this treatment. Dormant trees may also be sprayed with 10 per cent distillate emulsion.

If certain trees and shrubs prove especially difficult to keep clean, the best policy will be to remove them and replace with varieties which give less trouble. Walnuts are not good shade trees in the coast climates of California, for the reason that the walnut aphid will always give trouble. I would also advise that no more elms be planted, because of the certain spread of the European elm scale over the entire State. This scale will prove difficult to control.

Conifers, palms, and the various species of eucalyptus have so far proved the most free from pests, and so are best adapted for roadsides. The pepper tree, while very ornamental, is not suitable for localities where the black scale is troublesome. Olives are in the same class, and the various species of acacia should be handled sparingly and with discretion on account of their being especially favored hosts of the cottony cushion scale.

The county commissioners could perform a useful service by calling attention to such matters and publishing a list of trees best suited to the locality. [Applause.]

THE CHAIRMAN. Mr. Meserve of Los Angeles is chosen to lead the discussion, and on the evening when I left Los Angeles I happened to meet him and he said on account of the illness of his mother-in-law (he being at the train to meet some parties he had telegraphed for) he would not be here. He said he would send the paper up, but I have not received it as yet.

MR. MARCHBANK. I think the suggestions are very good, but they do not apply all over the State. I am glad he spoke about it, because the acacia trees are host plants for the cottony cushion scale in our county, but the olive trees are not host plants. The point that he made in regard to the horticultural commissioner calling attention to the public in regard to those things, I think is very good.

MR. BOWMAN. I would like to ask if you find that the tree becomes badly infested, in a bad state, all covered with fungus, and they seem to grow on the olive more or less, can you control that without fumigation? That is what I would like to know.

MR. VOLCK. Practically any insect can be controlled with this special solution or by spraying repeatedly with the more diluted solutions, which contain—by repeated applications in that case, or spraying with a strong solution once.

MR. SHAEFER. In our section of the State we are troubled a good deal with a sort of a twig borer that does quite a good deal of damage with the balm of Gilead. We have had some limbs cut down and we find a little twig borer cuts in and works around the limbs of the tree like a peach borer. During the summer these trees drop their leaves. We have so far found no remedy. I was in hopes that Mr. Volck would touch upon that particular insect, and I would like, if I could, to get a little light on it.

MR. VOLCK. I am unable to give any light on the control of that particular insect, except to suggest a liberal pruning and burning up of the brush.

MR. SHAEFER. Of course, that would help that particular case, but it destroys the beauty of the tree. I have sent specimens to Mr. Carnes, and he told me that he thought it was simply an injury in the bark where the borer would attack that particular part of the twig, but that is not the case. We find it all over, and they work in the same way as a peach borer. They are just about the size of a peach borer, and they look exactly like a peach borer.

MR. PEASE. Referring to Mr. Volck's remarks about our being more immune from the insect pest, I wish to say that I have almost come to the conclusion that whatever kind of trees we plant we might as well calculate on insects in the future. Probably most of you know that the pampas tree is very good feed for the red scale. You would hardly think it from the tree. The eucalyptus that he speaks about—until lately they have been perfectly immune, but just lately I have discovered a eucalyptus tree that is very badly infested with one of the spiders. If eucalyptus gets infested, we might as well calculate on everything.

MR. CUNDIFF. I would like to ask Mr. Shaefer about the larvæ. Have you ever looked for the larvæ.

MR. SHAEFER. No, I have not. I only came across it this fall. The first I saw of it was about a month ago.

MR. CUNDIFF. I think if you get the larvæ you will get at one of the species like a yellow jacket. I know it acts that way at the proper time.

MR. SHAEFER. These were mostly of a lighter color. There is no particular remedy for it?

MR. CUNDIFF. I have no suggestions of a remedy.

MR. JEFFREY. Mr. Chairman, I just want to call attention to Mr. Volek's statement about the elms. Of course, Mr. Volek knows exactly what he is talking about in reference to the infestation of the elms where he has observed it, but that is the finest shade tree in Sacramento and many other places, and I do not know many infestations. In the south and Los Angeles there have been some bad infestations, and they have all disappeared. Of course, we can not treat these things alike in different parts of the State. Mr. Wilsie has spoken of the conditions in that county; for instance, the noxious weeds in question differ there. The shade trees differ there. In all these matters relating to the insect pests and noxious weeds and shade tree pests, and our methods and plans have to suit the environments as far as possible; but I would like to say that I hate to hear a discouragement from Mr. Bowman of the application of the law to the control of the Johnson grass. There are some parts of the valley in the northern part of Sacramento Valley that are well-nigh overrun now. I know a peach orchard that is absolutely abandoned for no other reason than that the Johnson grass made it impossible in that particular soil for them to handle it, and the infestation is spreading. It is getting to be the question of the State, how to handle it. I do not know how to handle it; I don't believe anybody else knows it. I do not like to see the compulsory application of the law discouraged in this or any other organization. I believe you should encourage the application of the law to the Johnson grass, the Russian thistle, and the bachelor's button, and the other noxious weeds, and not weaken it by saying you can not exterminate these things by law.

MR. KNOWLTON. I just wanted to tell Mr. Shaefer that we had those borers in all of the balm of Gilead in our county, and I had always taken them to be flat-head borers, and I know they worked on the limbs of the apple trees that were growing next to the balm of Gilead.

MR. ROOSE. I want to get some information: In our county our principal shade trees are walnut and elm. The walnuts are infested and the elm trees are infested with elm tree scale. They line the streets of the town, and I would like to know whose duty it is to take care of those trees, the town or the property owners.

THE CHAIRMAN. Probably, under the circumstances, unless you have made some regulation for that, the property owners and not the city. I think at Pasadena the city looks after those trees. They make special provision for that in the city government. Mr. Rosen says that the insect bothers the balm of Gilead. Why should they not be cleaned up? That is one question I wanted brought out. The red scale is without doubt a serious pest with the camphor trees in Orange County, and we have camphor trees that are impossible to spray without a twenty-foot ladder, and they are growing not far from the orange orchards.

MR. VOLCK. In the case of the elm tree, that is not like any other

host plant that I know of. It is not very serious, and it is not a menace to the fruit industry of the State, and if the horticultural commissioners attempted to clean it up by law, they would be up against it.

THE CHAIRMAN. Is there any other question now? It is an even nine o'clock, and we have two papers. The next one is, "County License System, for Contract Spraying and Fumigation," by S. A. Pease of San Bernardino.

COUNTY FUMIGATING LICENSE SYSTEM.

MR. PEASE. *Mr. Chairman and Horticultural Commissioners:* In this country we have laws to govern or control practically everything we do. Among these, laws governing and controlling the handling of nursery stock, fruit, etc., have proven not only practical and profitable, but necessary to the successful conduct of the fruit industry.

Substantially all of the pests we now have were brought in because in earlier years we had no systematic quarantine. I think it unnecessary to go into detail concerning the pests that we have acquired in this manner or the millions of money spent in controlling and endeavoring to control them. At the present time, however, we have a good system of quarantine in our State and in most of our counties.

If it is desirable to have system in the matter of excluding pests, should we be less systematic in the matter of controlling those with which we are already burdened? In order to be successful in this control two things are especially necessary: first, knowledge of the best methods; and, secondly, some means for enforcing the use of these methods. In line with this first mentioned need, the Department of Agriculture was induced to send a man into the southern California field for the purpose, through experiments, of making our system of fumigation scientific. As a result, we now have the A. W. Morrill patent for marking tents to ascertain the distance over the trees when covered, and the R. S. Woglum schedule of dosage, published by the Department of Agriculture, and which may be had for the asking. With honest and intelligent men operating under this system, we can have uniform work and uniform results.

Now, as to the means of securing enforcement of these methods: Before these investigations, and up to the present date, the great trouble has been and is that many contract fumigators care more for money than for good results in their work. They refuse to mark their tents, because they do not intend to use the necessary amount of cyanide. The explanation they give the orchardist is that it requires an extra man to measure around the trees, and so increases their expense. I pinned one of them down in talking the matter over, and he said that I must know that he could not compete with our county methods or use as much cyanide as we do, and still make his required profit. When I questioned him closely, he admitted that his estimate of dosage on orchards *might* run under the half-ounce schedule.

Of course, the orchardists themselves are much to blame for accepting such work, but it is very hard to make some of them understand until a year later that this method is not economical, but that it will cost them much more money in the end than if the work had been well done the first time. Many have through such methods been compelled to repeat their work and duplicate the expense the succeeding year.

It is for such reasons as these that we were compelled to resort to the county license system. Under this method, before any contractor can operate in the county, he must apply for a license to the board of supervisors, and, to quote, "said board of supervisors shall order a license issued only after it finds from a report from the horticultural commissioner that the applicant understands the proper conduct of such business, and that his implements and apparatus are properly constructed and suitable for such business." The ordinance further recites that if such person or firm does any of the work in a negligent or unskillful manner, or uses improper materials, or insufficient quantities thereof, etc., that after a hearing his license may be revoked. This license is in no sense a means of raising money, the charge being only three dollars per quarter, but it is for the sole purpose of making the license valid, and so giving power to revoke same when necessary.

Some have asked why a contractor should be compelled to do good work. Most orchardists will have none but the best work, and it is their due that their interests shall not be jeopardized. As an illustration, say that all but one orchardist in a given block of orchards have had their orchards disinfected by the best method, this other single individual should not be allowed, through having poor work done, to greatly reduce the advantage gained by the others, by maintaining a breeding spot to reinfest all the orchards much sooner than would otherwise occur. If every orchardist would have the best work done in his orchard, I feel sure, from past experience, that it would not be necessary to fumigate oftener than once in three or four years. In fact, I have an example in Upland, where one of my fumigators disinfected at least three years ago, and to-day there is only a trace of scale there.

As to the efficiency of any kind of work in disinfecting, quite a question in many minds is: what per cent of scale killed can be called a satisfactory job? From remarks I have heard along this line I am sure that very few people have tried to figure out the problem. One man told me that everybody called 90 per cent satisfactory. I answered flatly that such a result would not warrant the orchardist in spending the money for the fumigation, and when I told him that I would not be satisfied with less than 99.9 per cent he held up his hands in amazement. Suppose, now, that we do a little figuring by way of illustration: It is conceded by the best authorities that the red and yellow scale, which are very similar in habit, produce four or more generations in a year in southern California, and the production of young has been quoted as being from 15 to 143. Professor Quayle, in his Bulletin No. 214, states that in experiments made by him the number varied from 25 to 143, with an average of 55 for each scale. To be very conservative in our figures, suppose we call the average production from each female 20 young, and on a badly infested tree call the number of scale on a leaf, 100. Now, after the tree had been disinfected, we will say 99 per cent of the scale were killed. You will readily see there will be one scale left to the leaf. Now, we will figure four generations from that one, and this will mean that we will have 20 scales for first generation, 400 for second generation, 8,000 for the third, and 160,000 for the fourth generation. To summarize, you will note that after the second generation we have 400, whereas we had only 100 scale in the beginning. If you cut this proposition three fourths, and call the average production of scale only

five, still, with one per cent left, four generations would produce 625 scales, where we started with 100. You can readily see that with this kind of work it would be necessary to fumigate several times each year to keep the scale from going on to the fruit.

One of the difficulties with which we are confronted in the matter of licensing contractors is that an ordinance of a board of supervisors is not operative in any municipality. This was determined in a suit brought in Riverside County. Each municipality has the right to frame their own ordinances for operation within their territory; hence, after the county ordinance is in operation, for effective work the same ordinance must necessarily be passed in each municipality, of which I happen to have five, in order that the commissioner may be allowed to operate under it. A state law is operative anywhere, either within a municipality or out of it, and considering this fact I think it extremely desirable that we should have a statute covering this feature, similar to one formulated by Professor A. W. Morrill for the State of Florida, from which I quote a section affecting this point, which may be found in the Journal of Economic Entomology for August, 1911, Vol. 4, No. 4: "When an orchard, grove or plants on any premises are found to be infested with an insect injurious to the horticultural interests of the county, and effective remedies or methods of eradication are known, then it should be the duty of the county entomologist to declare the infested trees, plants or premises public nuisances and to serve a legal notice as heretofore stated requiring *specified* remedial measures or methods of eradication, within a specified time," etc.

In southern California we have such a remedy, which is indisputable, as it is the result of about three years' operations through the Department of Agriculture, which is as high an authority as can be obtained. In this connection I may say that we have good assurance that Mr. Woglum will be returned to southern California to finish some experiments which he had started when recalled to take up work in another line. [Applause.]

THE CHAIRMAN. Mr. C. W. Beers of Santa Barbara County has been designated to open this discussion.

MR. BEERS. Mr. Chairman, it occurs to me that this subject has been very well handled by Mr. Pease, and handled by a man who has had extensive experience and whose address to us to-night has covered the question so thoroughly that the only thing remaining, in my judgment, is to put such queries that may arise in the minds of the individuals. Furthermore, it is getting late and we have a great deal to do; we have another paper, and with your permission I would rather not open up the debate any further, but open up the matter to those who would wish to ask individual questions.

I wish to say that in our county all our fumigating is done by the owners themselves; they own the outfits themselves, hire their own labor, and see that the work is done properly. The work done there is remarkable for its efficiency, because the moment that a man gets tired and tries to lie down, he gets fired and a new man is put in his place; and the moment that a man gets a little too slack in the keeping up of his portion of the work in regard to the preparation of the materials, or fumigating, he also is laid aside and a more decent man is selected. And so the work is kept to a high state of efficiency, and the result of

the work, according to the examination in our laboratory, is very satisfactory. I have failed yet to find one tenth of one per cent of living scale. No doubt it is somewhere, but I have not been able to detect it, and I have followed the work very closely, and in all of the material that I have carried to my laboratory I have not been able to catch a living scale from trees that have been fumigated.

THE CHAIRMAN. That is certainly a remarkable result. Of course, they do not spend \$200,000 a year and have a thousand tents going. The great trouble in my county is that they do not have to fire them; they just lay down and quit. That is one of the worst problems we have in the fumigation business — for a man running an outfit, to be able to keep his outfit going, and not be laid up in the early part of the season.

MR. ANDERSON. I would like to ask a question in regard to the cost.

MR. BEERS. About 23½ cents a tree.

MR. PEASE. I would like to say it might cost about 15 cents a tree, and it might cost \$2, but while our county was in operation, we did the work for actual cost. The county furnishes the tents and we operated the tents and hired the men to run it, but the cost of the operating was charged up to the owner of the orchard, and the cost of the chemicals. We bought the chemicals by the carload. The last year I was in we took about six carloads; we had only about 500 tents to operate. The amount of money expended for the county was \$90,000, but of that amount I returned about \$1,000, leaving the net expense to the county \$2,450. Of course, you would see that that would not pay the salaries of the inspectors and the commissioner, and the plant expense. If you are doing work that way and giving it away, I think the commissioners will agree with me that you would not like to have your books marked with red ink; you would rather have them show up the other way.

By the way, this year they are charging more than the cost for fumigating. We are raising what is called a sinking fund; that is, for the purpose of replenishing the tent outfit, so that when the tent is worn out they do not have to put their hands in their pockets; they will have a fund to replace the tents; but every tent is marked, and they use the Government schedule. I am trying my best to secure a uniform system, uniform work and uniform results. That is what we want.

THE CHAIRMAN. Is there anything else?

MR. GARDEN. The paper that Mr. Pease has just read is a very good one. There is only one point that seems to me, from my viewpoint, could be strengthened. It is this, that besides working under a county license, that he should also be under a bond. When a county requires any building done there is no contract let until the money is put up for equipment, which is a great safeguard to good work.

MR. PEASE. I would like to say in connection with that, that this work gradually grew on our county. It never was the intention of the horticultural law to do the amount of work we are doing in that county. Now, with one hand machine they only require one thousand dollars' bond to be put up; but it gradually grew that way. We just follow the letter of the law; we went to a man and said to this man, "I have called at your orchard and find red scale; I will give you five days' notice to clean up." Then the contractors would fumigate a man's orchard and

try to do the work and use one third of the chemical we use. So this man would say, "I want you to do the work." So we got to do more and more of the work rather than turn the work over to individuals. I want to say one more word. I want to tell you how we arrived at the conclusion that three fourths of an ounce to a hundred cubic feet was sufficient to kill any kind of scale in San Bernardino. I selected as badly an infested orchard as there was in Redlands, in order to make a test of a badly infested orchard, to really prove out our case. So Mr. Walkerman came over and he divided that off into sections. Mr. Kalkerman used a perfect tent in the first section, and used an ounce and a quarter of cyanide to a hundred cubic feet. He used forty minutes and an hour exposure. The next section he used an ounce to a hundred cubic feet and three fourths of an hour, and an hour. The last section he used half an ounce. And his conclusion was that with a perfect tent and three fourths of an ounce to a hundred cubic feet you can kill them all. The only way to mark tents for mending, I will say this — as long as I am talking about fumigation — and I want to tell you this, because I am sure that it is the point upon which depends the success: One man should walk under the tent and poke up a hole and on top should mark it with blue chalk, and then should come a man and mend all the holes.

THE CHAIRMAN. If there is nothing else we will pass to the next subject: "How Can Our Association Be Improved?" by William Garden, of Stockton.

MR. GARDEN. As I am put down on the paper the heading of the subject is "How Can Our Association Be Improved?" I have not put my subject on paper, because I do not believe it is worth it; but I have a few remarks to make. When I was a boy at school I learned a lesson one afternoon and I have not forgotten it yet. I was only four years old. I got a question in arithmetic to do, in addition. I did that one and it was correct. I asked the teacher for another one, and I finished that one and it was correct; and I finished four and they were correct. She would give me no more. She said, "You have got enough." And so the shorter that anything is the easier we remember it. So I have only a few remarks to make on this subject; and you will not forget them; you will remember them next time.

Now, the subject, "How Can Our Association Be Improved?" Our association is an association of county horticultural commissioners, or "bug hunters," as we are called in general; that is generally what we are known by; and we are generally considered the biggest bugs of all the bugs.

Now, gentlemen, the correct point to start out, I believe, is with each individual here. Self-improvement, investigation by one's self — that is one source that we may learn from. In a great many instances it is dearly bought experience. We can also learn from the experience of others, and when we meet together and we listen to each one's say so, why, we put it all together, and each one measures himself by the other one's knowledge, and he soon finds exactly where he is in his level in knowledge of anything that he is in search of.

Now, we are young scholars, although we are pretty old ones, some of us. We are in the school of experience, and we will be there as long as we are in the field of usefulness. None of us knows it all. Whenever

we do, we had better get to one side, for whenever we can not take anything else in, our head is full. [Laughter.]

There are various means whereby our association can be greatly improved, I believe; and I am not going to say any self-praise at all, for whenever one starts to praise one's self, it is a pretty good sign that his trumpeter is dead. But I have heard it remarked, and I know it is true, that the country horticultural commissioners have greatly improved. That is one good thing.

Now, if we are going to improve our associations we have to avail ourselves of the means within our reach. There are men amongst us, scientific men, men who have made sufficient study whereby we can be benefited by their knowledge. I would suggest this, that the next time that our association meets, we follow the same line as we have this time; have meetings between stations, and have it so arranged that we get the knowledge of those scientific men on specific subjects, have them impart knowledge to us on subjects that we are ignorant on.

One of the things, I believe, that we are very ignorant on — that is, in general, practically speaking, and also many of us have given it a good deal of study, and that is in regard to fungus diseases of the trees. Now, we need knowledge on that, and we have not had very much talk on that subject this time. So, I think that that would be one way whereby we would be greatly benefited.

Another way that we can be benefited is by coöperation. That is a great thing. We should coöperate amongst ourselves, coöperate with the educational department, coöperate with the school department, and disseminate what knowledge we have got, and be ready to receive knowledge from those that have more knowledge than we have.

Now, as a means of benefiting the commissioners and their offices which they have to perform to the fruit grower and the public in general, it has occurred to me that we county commissioners could perform a good work to the University of California and the University of California could in return do us a great and good work; I don't know whether it may be acceptable, or whether it may not; however, discussion will bring that out. How many commissioners are there in the State of California to-day? Does any one know?

THE CHAIRMAN. I think forty-one.

MR. GARDEN. Forty-one men. Take the commissioners and the inspectors together, and you have got quite a large force of men in the field all over California. They are all bug hunters, and I believe they could catch a good many of them, and the University needs them. They need bugs as well as books. The University of California should have a first-class entomological museum, backed up by a first-class library, which would be available to us as well as to the young students, for studying along the lines of agriculture; and in return for that they would have the means of preserving insects, mounting them, and returning to each commissioner a percentage of the bugs forwarded, and each commissioner in his county would then have a collection of insects for exhibition, and for identification in his own county.

Now, that seems to me a very easy way, besides the county commissioner has not got the means, neither has he the knowledge, nor would the board of supervisors, I believe, in general, stand for furnishing these men with the chemicals and instruments necessary for that purpose.

Now, I throw that out as a suggestion and for your consideration, and I do not know that I have very much more to say on this matter. I think we ought to coöperate more than we have done. And we have done so and learned a great deal from each other at this convention at Santa Rosa. I thank you, gentlemen. [Applause.]

THE CHAIRMAN. Mr. Garden suggested that we are called bug hunters. I might tell you that in my county I am called Mr. Johnson-Grass part of the time. The discussion on this point is to led by Mr. Marchbank of Madera County.

MR. MARCHBANK. *Mr. President, and Ladies and Gentlemen:* It is getting very late and I do not wish to take up your time. It has occurred to me that we are much improved and benefited by coming together in this way. We exchange ideas and in that way we are helped, and we get help from the professors who attend these meetings, and are able to advise us; and the friendship, one with another, is also a benefit to us.

I think if we could meet oftener, and if we could group the counties of the State where the conditions are similar, and similar problems are to be met, and transportation and convenience of getting together would be reduced to a minimum, it would be beneficial. For instance, the Sacramento Valley and San Joaquin County put into one group; the counties south of San Francisco into one group; the Bay counties and the counties south of San Francisco making about six groups of counties. In that way we could meet much easier and we could invite, for instance, some one from the University, or from the State Board of Horticulture, who was capable of advising us and instructing us, to meet with us when we meet; and I think in that way we would be much benefited.

The object of this association, as I understand it, is to protect the growers, and also to benefit the growers in any way possible. There are many people coming to California. They are looking for land and are unacquainted with the conditions here; and the horticultural commissioners who are acquainted in the localities where they live, and who are men of experience, are able to advise those parties as to the adaptation of plant to soil. I believe from my experience, from what I know in California, that millions of dollars have been lost by people coming out here with the idea that they can grow raisin grapes on any soil or grow them without an idea of plant life or soil. Real estate agents tell them that a few hundred dollars an acre can be got off such and such a crop, and they run away with the idea that that is the crop they want, and they get hold of a piece of land that may not be adapted to that crop at all; and I think in that way the horticultural commissioner can be an adviser to the incoming people of California. I do not know as I have much more to suggest. Thank you. [Applause.]

MR. BOWMAN. I would like to speak about this insect collecting business. I will be as brief as possible. In the demonstration train I met Mr. Birdwell, under Mr. Woodworth at the University, and he wanted me especially to bring up this point at this meeting. He said that the University did not have a complete collection of California insects, that they at the University would coöperate with us, and that he thought it would be a splendid idea to have a lot of labels printed, locality labels; for instance, Sonoma County or Placer County, or

Orange County, and send them to us, and when we were around inspecting it would be a very simple matter to get a great amount of insects in a short time, if these were properly prepared, if you have generally all you can use — not to send in too many duplicates. We want to identify our own specimens as much as possible. The cost to us is very immaterial, and we could get a complete collection of our own insects from our own county, and we could in a very short time get them from the other parts of the State. I suppose either the University or the Sacramento Insectary would be the best place to put them. Mr. Woodworth tells me there are 10,000 insects that have been described, that he is writing on himself. It would be a great thing if we had them. Mr. Woodworth tells me he has all the commonest kinds, but there are a great many that we do not understand. Even the bud moth — I have only found it in two instances; and if some of the commissioners found them on the tree, they would not know whether it was a cluster of the gypsy moth, or a cluster of the black moth. And I think it is very educational, a study of insects; and if we want to see them alive, we can remember them far better than from any description. We can go to the Insectary, but they have not got a complete collection; some very common names are not to be found there. The University has a splendid collection, but it is not always accessible.

I got a case made three by four feet — 36 by 48 inches. It cost me \$8.25, and I have managed to put in 600 insects without crowding in that case. I started in in April, and when I was around inspecting the orchard, if I saw an insect I would catch it and put it in a bottle of cyanide. The United States Museum publishes a bulletin that you can all get for nothing. It is a 150-page bulletin and it describes the manner of collecting insects. It is a splendid work, and they will send it to you, and I would be very much pleased to exchange with the different counties and get their insects. I always get duplicates of my own, and I know it would help us out in that line a great deal. I would like to ask Mr. Woodworth in regard to this, if it is practical at all.

THE CHAIRMAN. I was just going to call on Professor Woodworth to speak on this subject.

MR. WOODWORTH. I would say that the University of California would be very glad to act as a clearing house if the members of the association wish to exchange insects, and would be very glad to identify insects as far as it is in our power to do so. Of course, I am not sure to what extent they can carry that out with their present facilities, but as far as they can, unless you crowd us too hard, we will be very glad to identify insects for you. I have had in mind for some time, but we have never seen our way positively clear to the realization of it — the development of a scheme very much like that which has been outlined here to-night, for the public schools that might coöperate in securing main collections in that way, and I am sure also that the public school system might be something that would swamp us entirely. We are probably ready to carry on the work that the horticultural commissioners might want done, because there are not so many of them as schools; so I am sure you can count on us for anything of that kind, or anything that is within our power to do.

THE CHAIRMAN. You might do that with the commissioners, and let the commissioners attend to it with the schools. There is one other

person I want to call upon to speak upon this subject, and give us his suggestion, and also how he feels about coöperation upon this insect trouble, and others that come up. I wish to call upon the State Commissioner, Professor Cook.

PROFESSOR COOK. Mr. President, I thank you for this courtesy. As you all know, I am new among you, and more pleased to listen than to talk. I have been all my life a student and collector of insects. It will be a pleasure always to receive insects from any of you, to identify them, and to advise as to best means of control. I shall take it as a special favor if you will always send to our office any insect pest that attracts your attention, as this will bring us knowledge of what is doing in this great field of insect destruction. You may rest assured that any request or inquiry will always receive quick response. I will promise you most hearty coöperation, and will, so far as possible, aid to build up in your several offices illustrative collections that will aid you and your fruit-growing patrons. These conventions must be of signal benefit to you all. Each of you has valuable experience to hand over to his brother commissioners, each can and will learn from the others in attendance.

I trust our Monthly Bulletin will help all and that each of you will contribute to make its pages of greater value. Do not fail to send in any new or valuable discovery or observation. We must make it a live agent in this insect warfare.

One of you referred to the need of more knowledge regarding fungi. Our Professor Fawcett, who will come the first of February, will give us all valuable information, and you are all invited to make fullest use of his wide knowledge.

May I add that I shall always welcome suggestions as to how our work may be made more valuable? We shall wish to make your work more efficient, and you may count on always receiving courteous treatment in all our relations with each other.

A very important part of our work will be our quarantine. I shall be very glad at all times to receive suggestions in relation to our quarantine service. I am sure we can be mutually helpful to each other in this part of our work.

I thank you, Mr. President, for your kind invitation to address you at this time, and you, gentlemen, for so kindly listening at this very late hour. [Applause.]

THE CHAIRMAN. Probably no one has a better opportunity to furnish us with specimens properly named and described and with information of those things which are outside of the State, and which we are in hopes we will be able to keep outside of the State by furnishing specimens of such, as the Mediterranean fly and the orange maggot, and anything else — things that the county commissioner himself can not find and send to you, for which we are very thankful, but would be of great scientific interest, great personal interest to most of us as commissioners, because we are more or less entomologists, and more or less interested in that line of work. I think it would be a wonderful and good thing. Up to the present time I have never received any of those specimens, and I have been a little afraid that a dead one would come out of the bottle and I would get into trouble over it.

I believe this is all we have. In closing I wish to thank those who

have taken part in the program. The time for fixing the program was late. I simply wrote the program without consulting, and every party whom I requested to present a paper responded very readily. The program was sent to the State Horticultural Commissioner, and he sent it back and said it was all right; and we have had our program as you have witnessed it.

I wish to thank the commissioners for having chosen me as their President, and I shall try to do as well in future as in the past; and having been reelected, I will presume that I have pleased them in the past.

CONSERVATISM IN FRUIT GROWING.*

By FREEMAN B. MILLS, Woodbridge, Cal.

The American people are, by birth and training, foes of conservatism. The conservatives of 1776 went down to defeat before the enthusiasm of reactionaries George Washington, John Hancock, and Thomas Jefferson. Radicalism, or progressiveness has become a tradition in America. The do-somethings are always in the majority. The let-well-enough-alones always play a losing hand. The pessimist's proper and only place is on the fence making faces at the flaunting pennants of the marching progressives. The conservative is a brake on the wheel of the car of progress, a dam in the path of the rushing stream, an atmospheric abyss in the track of the gliding aeroplane. The progressives do all the things that are done. The conservative's function is that of the watch dog; to keep his eye on the progressives and see that they stay within due and proper bounds.

We can not enthuse over the conservatives as we do over the progressives. Progressives are always spectacular. They are the people who "point with pride." They have lifted the race from the satisfaction with mud huts and cave dwellings to automobiles and ocean greyhounds. Their gospel is affirmation, and success is but the stepping stone on which they travel in the onrush for greater victories.

Yet conservatism has its place in the world's progress. The brakeless car dashes over the precipice and carries its occupants to destruction. The unbridled stream rushes from its banks, and lays in ruins the handiwork of years. The rudderless vessel swerves from its course, leaving lives and treasure as the toll of its shipwreck.

The graveyard of the industrial world is filled with monuments to the victims of unbalanced enthusiasm. The "busted" Belgian hare devotees, the ginseng enthusiasts, the raisin men of bygone days, and the prune growers of recent years, are all examples that Josh Billings was utterly mistaken in his assertion that if you have a good thing you can't have too much of it. A good thing for a few frequently becomes a miserable failure for the many. The grower who runs when every one else stands still and who stands still when everybody else runs may be selfish, and in a sense unpatriotic; but he is more apt to bring home the bacon than is he who joins the wild scramble to assist in harvesting the profits reaped by the few who catered to a demand, urgent because unsatisfied.

*NOTE.—This paper was received after the convention and is included in the regular proceedings.

The elements which bring profit or loss to the fruit grower are, like Cleveland's tariff issue, largely local. The foothill grower who gets his fruit into an unsupplied market laughs at the croaking of the conservative who predicts ruin ahead. The Imperial Valley grape man who receives a fabulous price for his early crop can safely offer up thanks that he is not as other men.

Broadly speaking, any man who can raise a crop at a little distance in time from those of his neighbors will, for a while at least, have nothing to fear from the indiscriminate competition of his rivals. But to the great mass of growers the menace of unrestricted competition looms up with ruin in its mien. The table grape growers of California's great central valley are face to face with the well-nigh unsolvable problem of the profitable marketing of their product. The widespread planting of table grapes, without regard for the condition which would arise as the result of such vast increase of production, has brought to the verge of ruin an industry which conservatism would have maintained in a healthy and satisfactory condition. At one of the late State Fruit Growers' Conventions the writer was called upon to present a paper upon "The Outlook of the Table Grape Industry." In this paper he took occasion to urge upon all growers a careful consideration of the gloomy outlook for the table grape people. He asked that every effort be taken to reduce the output to eastern markets by utilizing all local measures of reduction as a safeguard. The disposal of all questionable or medium quality stock to wineries, the adoption of rigid inspection regulations, the discouragement of further planting, the maintenance of a high-grade pack by the rejection of every bunch which in any way raised a question in the mind of either packer or owner, were some of the means urged to alleviate the threatening conditions. The reasonableness of these precautions for the preservation of a great industry was recognized by all thinking growers, yet with a lamentable lack of foresight the wideawake, enterprising growers permitted their fears of injury to become an actuality through the disregard and carelessness of the great mass of growers. In our own district at Lodi, which is the great Tokay district of the State, hundreds of cars of grapes were permitted to go forward which, either in whole or in part, should have been rejected. A system of inspection, which though lax and incomplete, has worked beneficial results during the preceding season, was, through the apathy of the growers, allowed to lapse, leaving every shipper a law unto himself as to what he should pack and what throw aside. The disastrous prices of last year, the widespread prevalence of red ink returns, the absorption of profits on the few good sales by the many poor ones, all demonstrate the folly of withholding control from this business. "Combination in restraint of trade" may be unlawful, but indiscriminate and unchecked shipping is ruinous. Growers owe it to themselves to adopt every precaution to protect their interests and to eliminate the vision of the poorhouse which begins to take shape in the background of many a grape man's forecast of the future.

What has happened to the grape growers' business may easily occur to coördinate branches of this great industry. Already the apple growers view with alarm the vast planting of this fruit in the unrestricted area of the Northwest. With a production which carefully informed observers estimate will reach 100,000 carloads within four

years, the apple grower is beginning to ask himself whether the ownership of an apple orchard is as unlimited a blessing as he thought in years gone by.

The practical depletion of all the nursery stock in this State, even before the planting season has begun, points to a vast increase in the orchard area of California during the coming spring. Unquestionably this arises from the fabulously high prices prevailing during the first part of this year's shipping season. These prices arose from conditions which are not likely to be often repeated. Conservatism in every line of orchard business should commend itself to every planter if the industry is to be maintained in a lucrative condition. Conservatism in planting alone will not avail. A systematic, intelligent, and persistent conservatism in packing, a conservatism which manifests itself in utilizing every possible local channel for the disposition of second-rate stock, a rigid exclusion of all questionable supplies from eastern shipments, in other words, the feeding to the market of only what it can assimilate, these are the principles upon which the fruit growers may work out a satisfactory solution of the many problems which now confront them.

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